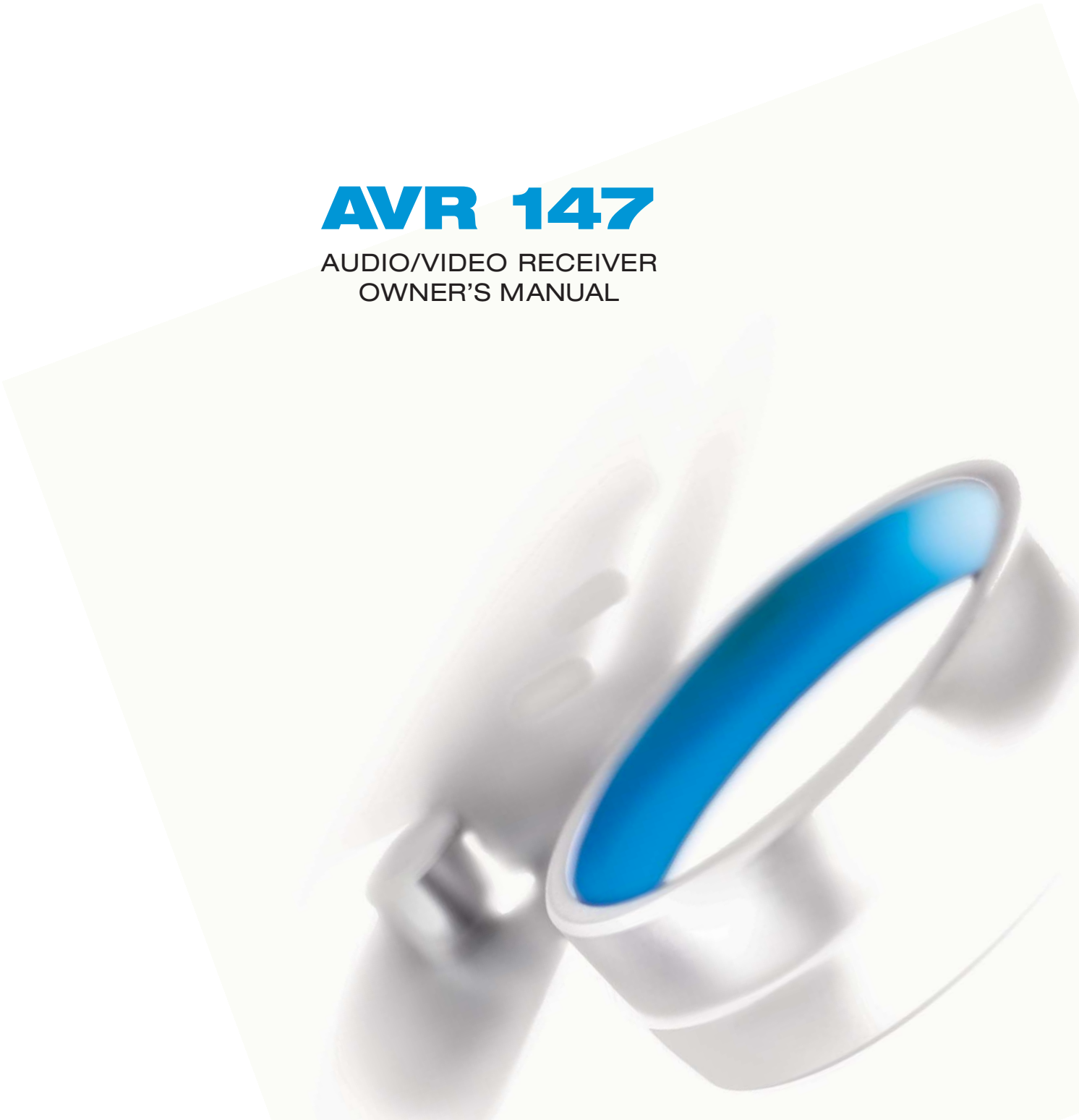
harman/kardon®

Designed to Entertain.™

AVR 147

AUDIO/VIDEO RECEIVER
OWNER'S MANUAL



SAFETY INFORMATION

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: To reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.

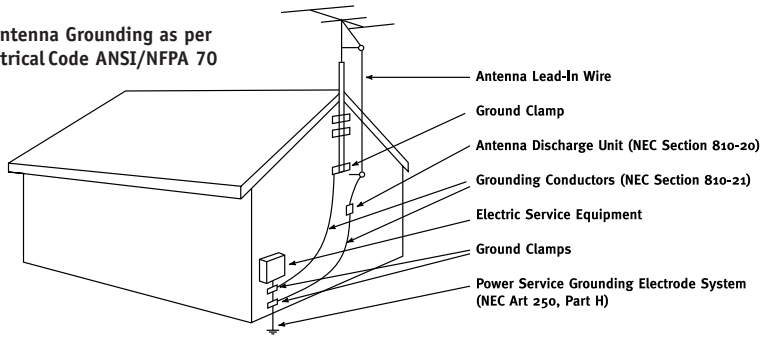
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. **Read Instructions.** All the safety and operating instructions should be read before the product is operated.
2. **Retain Instructions.** The safety and operating instructions should be retained for future reference.
3. **Heed Warnings.** All warnings on the product and in the operating instructions should be adhered to.
4. **Follow Instructions.** All operating and use instructions should be followed.
5. **Cleaning.** Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6. **Attachments.** Do not use attachments not recommended by the product manufacturer, as they may cause hazards.
7. **Water and Moisture.** Do not use this product near water – for example, near a bathtub, wash bowl, kitchen sink or laundry tub; in a wet basement; near a swimming pool; or the like.
8. **Accessories.** Do not place this product on an unstable cart, stand, tripod, bracket or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.
9. **A Product and Cart Combination Should Be Moved With Care.** Quick stops, excessive force and uneven surfaces may cause the product and cart combination to overturn.

10. **Ventilation.** Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should not be placed in a built-in installation, such as a bookcase or rack, unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
11. **Power Sources.** This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.
12. **Polarization.** This product may be equipped with a polarized alternating-current-line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.
13. **Power-Cord Protection.** Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.
14. **Nonuse Periods.** The power cord of the product should be unplugged from the outlet when left unused for long periods of time.
15. **Outdoor Antenna Grounding.** If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure A.
16. **Lightning.** For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.
17. **Power Lines.** An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.
18. **Overloading.** Do not overload wall outlets, extension cords, or integral convenience receptacles, as this can result in a risk of fire or electric shock.
19. **Object and Liquid Entry.** Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
20. **Servicing.** Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
21. **Damage Requiring Service.** Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    a. The power-supply cord or the plug has been damaged; or
    b. Objects have fallen onto, or liquid has been spilled into, the product; or
    c. The product has been exposed to rain or water; or
    d. The product does not operate normally when following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation; or
    e. The product has been dropped or damaged in any way; or
    f. The product exhibits a distinct change in performance; this indicates a need for service.
22. **Replacement Parts.** When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
23. **Safety Check.** Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
24. **Wall or Ceiling Mounting.** The product should be mounted to a wall or ceiling only as recommended by the manufacturer.
25. **Heat.** The product should be situated away from heat sources such as radiators, heat registers, stoves or other products (including amplifiers) that produce heat.

Figure A.
Example of Antenna Grounding as per National Electrical Code ANSI/NFPA 70


Antenna Lead-In Wire
Ground Clamp
Antenna Discharge Unit (NEC Section 810-20)
Grounding Conductors (NEC Section 810-21)
Electric Service Equipment
Ground Clamps
Power Service Grounding Electrode System (NEC Art 250, Part H)

Important Safety Information

Verify Line Voltage Before Use

Your AVR 147 has been designed for use with 120-volt AC current. Connection to a line voltage other than that for which it is intended can create a safety and fire hazard and may damage the unit.

If you have any questions about the voltage requirements for your specific model, or about the line voltage in your area, contact your selling dealer before plugging the unit into a wall outlet.

Do Not Use Extension Cords

To avoid safety hazards, use only the power cord attached to your unit. We do not recommend that extension cords be used with this product. As with all electrical devices, do not run power cords under rugs or carpets or place heavy objects on them. Damaged power cords should be replaced immediately by an authorized service center with a cord meeting factory specifications.

Handle the AC Power Cord Gently

When disconnecting the power cord from an AC outlet, always pull the plug; never pull the cord. If you do not intend to use the unit for any considerable length of time, disconnect the plug from the AC outlet.

Do Not Open the Cabinet

There are no user-serviceable components inside this product. Opening the cabinet may present a shock hazard, and any modification to the product will void your guarantee. If water or any metal object such as a paper clip, wire or staple accidentally falls inside the unit, disconnect it from the AC power source immediately, and consult an authorized service center.

CATV or Antenna Grounding

If an outside antenna or cable system is connected to this product, be certain that it is grounded so as to provide some protection against voltage surges and static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements of the grounding electrode.

NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call the CATV (cable TV) system installer's attention to article 820-40 of the NEC, which provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as possible.

Installation Location

- To ensure proper operation and to avoid the potential for safety hazards, place the unit on a firm and level surface. When placing the unit on a shelf, be certain that the shelf and any mounting hardware can support the weight of the product.
- Make certain that proper space is provided both above and below the unit for ventilation. If this product will be installed in a cabinet or other enclosed area, make certain that there is sufficient air movement within the cabinet. Under some circumstances, a fan may be required.
- Do not place the unit directly on a carpeted surface.
- Avoid installation in extremely hot or cold locations, or in an area that is exposed to direct sunlight or heating equipment.
- Avoid moist or humid locations.
- Do not obstruct the ventilation slots on the top of the unit, or place objects directly over them.
- Due to the weight of the AVR 147 and the heat generated by the amplifiers, there is the remote possibility that the rubber padding on the bottom of the unit's feet may leave marks on certain wood or veneer materials. Use caution when placing the unit on soft woods or other materials that may be damaged by heat or heavy objects. Some surface finishes may be particularly sensitive to absorbing such marks, due to a variety of factors beyond Harman Kardon's control, including the nature of the finish, cleaning materials used, and normal heat and vibration caused by the use of the product, or other factors. We recommend that caution be exercised in choosing an installation location for the component and in normal maintenance practices, as your warranty will not cover this type of damage to furniture.

Cleaning

When the unit gets dirty, wipe it with a clean, soft, dry cloth. If necessary, and only after unplugging the AC power cord, wipe it with a soft cloth dampened with mild soapy water, then a fresh cloth with clean water. Wipe it dry immediately with a dry cloth. NEVER use benzene, aerosol cleaners, thinner, alcohol or any other volatile cleaning agent. Do not use abrasive cleaners, as they may damage the finish of metal parts. Avoid spraying insecticide near the unit.

Moving the Unit

Before moving the unit, be certain to disconnect any interconnection cords with other components, and make certain that you disconnect the unit from the AC outlet.

Important Information for the User

This equipment has been tested and found to comply with the limits for a Class-B digital device, pursuant to Part 15 of the FCC Rules. The limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that harmful interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

NOTE: Changes or modifications may cause this unit to fail to comply with Part 15 of the FCC Rules and may void the user's authority to operate the equipment.

Unpacking

The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration. We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair.

To minimize the size of the carton in storage, you may wish to flatten it. This is done by carefully slitting the tape seams on the bottom and collapsing the carton. Other cardboard inserts may be stored in the same manner. Packing materials that cannot be collapsed should be saved along with the carton in a plastic bag.

If you do not wish to save the packaging materials, please note that the carton and other sections of the shipping protection are recyclable. Please respect the environment and discard those materials at a local recycling center.

It is important that you remove the protective plastic film from the front-panel lens. Leaving the film in place will affect the performance of your remote control.

STAPLE INVOICE HERE

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WARNING

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

For Canadian model

This class B digital apparatus complies with Canadian ICES-003.
For models having a power cord with a polarized plug:
CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

Modèle pour les Canadien

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
Sur les modèles dont la fiche est polarisee:
ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.

INTRODUCTION

Please register your AVR 147 on our Web site at www.harmankardon.com.

Note: You'll need the product's serial number. At the same time, you can choose to be notified about our new products and/or special promotions.

WWW.HARMANKARDON.COM

Thank you for choosing Harman Kardon®!

In the years since Harman Kardon invented the high-fidelity receiver, we have taken to heart the philosophy of bringing the joy of home entertainment to as many people as possible, adding performance and ease-of-use features that enhance the home entertainment experience. In the years since our first single-channel component was introduced, Harman Kardon has offered a number of receiver models, each an improvement upon its predecessors, leading to the AVR 147, a 5.1-channel digital audio/video receiver that offers a wealth of listening and viewing options, all in an elegant package.

To obtain the maximum enjoyment from your new receiver, we urge you to read this manual and refer back to it as you become more familiar with its features and their operation.

If you have any questions about this product, its installation or its operation, please contact your retailer or customer installer, or visit our Web site at www.harmankardon.com.

AVR 147 5.1-Channel Audio/Video Receiver

Audio Section

- 40 Watts x 5, five channels driven at full power at 8 ohms, 20Hz – 20kHz, <0.07% THD, (surround modes); 200 watts total
- 50 Watts x 2, two channels driven at full power at 8 ohms, 20Hz – 20kHz, <0.07% THD, (surround off mode); 100 watts total
- High current capability, ultrawide bandwidth amplifier design with low negative feedback
- All-discrete amplifier circuitry
- Dual independent power supplies, for front and surround channels
- Triple crossover bass management
- 24-Bit, twin-core Cirrus Logic® CS 49510 DSP processor with 32-bit post processor
- 192kHz/24-bit D/A conversion
- Sampling upconversion to 96kHz

Surround Modes

- Dolby® Digital
- Dolby Pro Logic® II (Movie, Music and Game)
- Dolby Virtual Speaker Version 2 (Reference 2- or 3-speaker; Wide 2-, 3-, 4- or 5-speaker)
- Dolby Headphone Version 2
- DTS® (5.1; DTS Stereo)
- DTS 96/24™ (DTS Stereo)
- DTS Neo:6® (Cinema 3- or 5-channel; Music 5-channel)
- Logic 7® (Cinema, Music and Enhance)
- Hall 1 and Hall 2
- Theater
- 5-Channel Stereo
- Surround Off (DSP or Analog Bypass)

Audio Inputs

- AM/FM/XM®* tuner
- CD
- Tape
- 6-Channel direct
- The Bridge /DMP for iPod** connectivity

Audio/Video Inputs (With S-Video)

- Video 1
- Video 2
- Video 3
- DVD
- Two 100MHz assignable component video inputs
- Simplay HD™-verified HDMI™ 1 and 2 (switching only)

Digital Audio Inputs

- Coaxial: Two rear-panel/one front-panel
- Optical: Two rear-panel/one front-panel

Outputs

- Subwoofer output
- Tape (analog audio)
- Video 1 (analog audio and video)
- Video Monitor (composite, S-video and component)
- Digital Audio (one coaxial, one optical)
- Simplay HD-verified HDMI (switching only)
- Headphone

Ease of Use

- EzSet/EQ™ automated setup (microphone included)
- On-screen display with composite and S-video; choice of blue or black background
- Two-line dot-matrix front-panel display
- Color-coded connections
- Programmable ten-device main remote control
- Source input renaming
- A/V Sync Delay
- RS-232 serial port for system upgrades
- Switched accessory power outlet

Simplay HD The AVR 147 is Simplay HD-verified for compatibility via the HDMI connection with other Simplay HD-verified products.

Supplied Accessories

The following accessory items are supplied with the AVR 147. If any of these items are missing, please contact Harman Kardon customer service at www.harmankardon.com.

- System remote control
- EzSet/EQ microphone with extender rod
- AM loop antenna
- FM wire antenna
- Three AAA batteries
- Two covers for front-panel jacks

*XM antenna module and subscription to XM service required. Handware and service sold separately. XM service is not available in Alaska and Hawaii.

**Compatible with all iPod models equipped with a dock connector. Not compatible with iPod shuffle models. Images and videos stored on iPod photo and video models may be viewed.

FRONT-PANEL CONTROLS

Main Power Switch: This mechanical switch turns the power supply on or off. It is usually left pressed in (On position), and cannot be turned on using the remote control.

Standby/On Switch: This electrical switch turns the receiver on for playback, or leaves it in Standby mode for quick turn-on using this switch or the remote control.

Power Indicator: This LED has three possible modes. When main power is turned off, the LED is dark and the receiver won't respond to any button presses. When main power is turned on, but before the Standby/On Switch is used, the LED turns amber to indicate that the receiver is in Standby mode and ready to be turned on. When the receiver is turned on, the LED turns blue.

Source Select: Press this button to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner.

Source Indicators: The name of the current source input lights up. The indicated input changes each time the Source Select button is pressed.

Volume Knob: Turn this knob to raise or lower the volume, which will be shown in decibels (dB) in the Message Display.

Message Display: Various messages appear in this two-line display in response to commands and changes in the incoming signal. When the on-screen display menu system (OSD) is in use, the message OSD ON will appear to remind you to check the video display.

Tuner Band: Press this button to select the tuner as the source, to switch between the AM and FM bands, or to select XM satellite radio.

Tuning: Press either side of this button to tune a radio station or XM channel.

Tuning Mode: This button toggles between manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) tuning mode. It also toggles between stereo and mono modes when an FM station is tuned.

When XM Radio is in use, pressing this button repeatedly displays the channel name, category, artist and track title in the lower line of the Message Display. For traffic-and-weather channels, this button displays the city, channel name, local weather and local temporature.

Preset Stations: Press this button to select a preset radio station.

Headphone Jack/EzSet/EQ Microphone Input: Plug a 1/4" headphone plug into this jack for private listening.

This jack is also used to connect the supplied microphone before beginning the EzSet/EQ procedure described in the Initial Setup section. To begin EzSet/EQ, plug the supplied microphone into this jack, place the microphone at the listening position, and follow the directions given in the EzSet/EQ on-screen menu.

Surround Mode: Press this button to select a surround sound (e.g., multichannel) mode group. Choose from the Dolby modes, DTS modes, Logic 7 modes, DSP modes or Stereo modes.

Surround Select: After you have selected the desired surround mode group, press this button to select a specific mode.

Surround Mode Indicators: One or more of these icons may light up as you select different surround modes. The Message Display also indicates the surround mode.

Analog Audio, Video and Digital Audio Inputs: Connect a source component that will only be used temporarily, such as a camera or game console, to these jacks. Use only one type of audio and one type of video connection.

Speaker/Channel Input Indicators: The box icons indicate which speaker positions you have configured, and the size (frequency range) of each speaker. When a digital audio input is used, letters will light inside the boxes to indicate which channels are present in the incoming signal.

Navigation: These buttons are used together with the following five buttons to make selections.

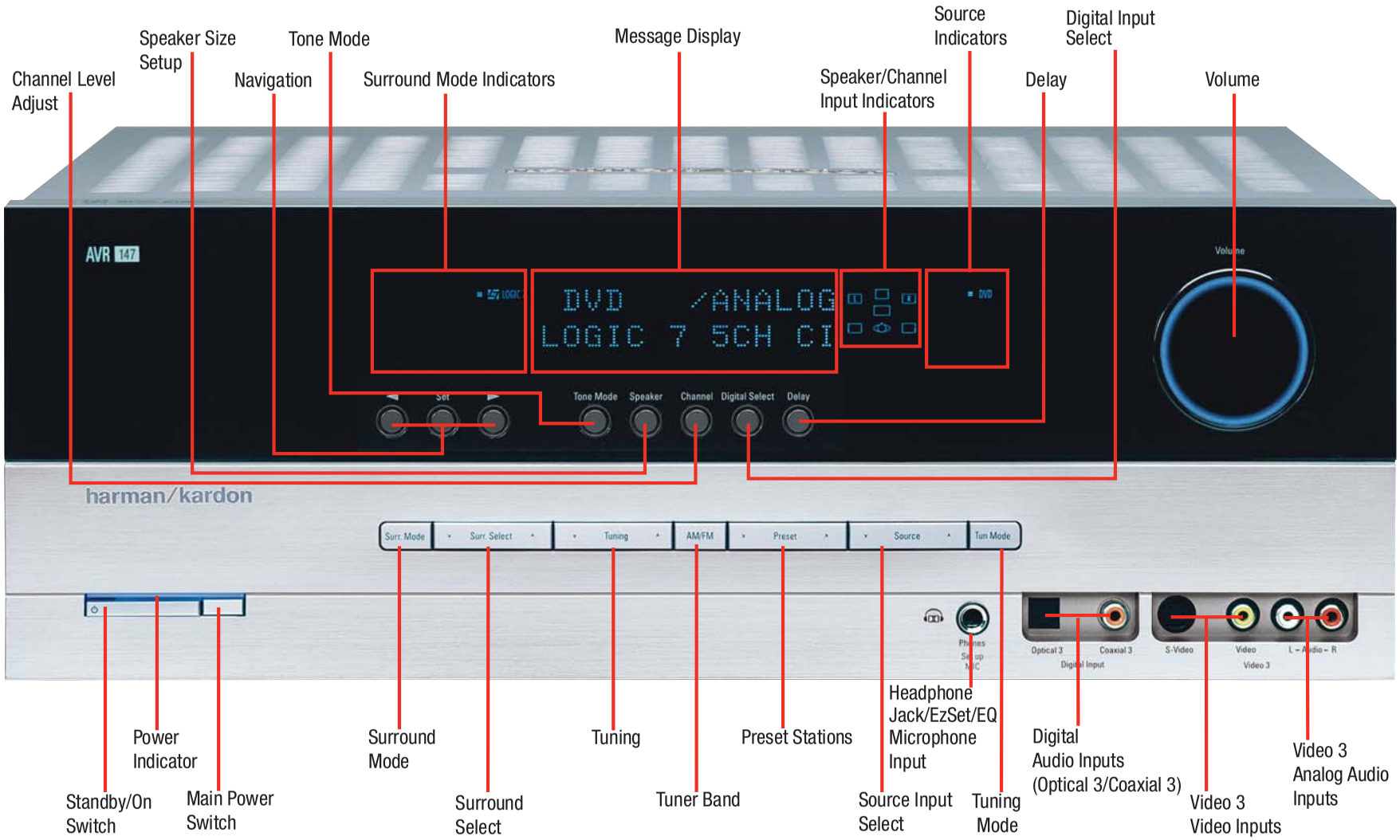
Tone Mode: Press this button to access the tone controls (bass and treble). Use the ◀/▶ Navigation Buttons to make your selections.

Speaker: Press this button to configure speaker sizes, that is, the low-frequency-range capability of each speaker.

Channel Level Adjust: Press this button to set the output level for each channel so that all speakers sound equally loud at the listening position.

Digital Input Select: Press this button to select the specific digital audio input (or analog audio input) you used for the current source.

Delay: Press this button to set delay times that compensate for placing the speakers at different distances from the listening position.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

REAR-PANEL CONNECTIONS

AM and FM Antenna Terminals: Connect the included AM and FM antennas to their respective terminals for radio reception.

XM Antenna Jack: Plug in an XM antenna module here. The XM antenna module is purchased separately, and should specify that it is for home use with an XM Ready® product. You will need to subscribe to the XM service, which is available separately, and activate the service for your antenna module. (XM service is not available in Alaska and Hawaii.)

Front, Center and Surround Speaker Outputs: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. Remember to observe the correct polarity (positive and negative connections). Always connect the positive lead to the colored terminal on the receiver and the red terminal on the speaker. Connect the negative lead to the black terminal on both the receiver and the speaker. See the Connections section for more information on connecting your speakers.

Subwoofer Output: If you have a powered subwoofer with a line-level input, connect it to this jack.

Video 1, Video 2 and DVD Audio/Video Inputs: These jacks may be used to connect your video-capable source components (e.g., VCR, DVD player, cable TV box) to the receiver. Use only one type of video connection for each source. See the Connections section for more information on audio and video connection options for each source component.

Video 1 Audio/Video Outputs: These jacks may be used to connect your VCR or another recorder.

Composite and S-Video Monitor Outputs: If some of your sources use composite or S-video connections, connect one or both of these monitor outputs to the corresponding inputs on your television or video display to view them.

HDMI Inputs and Output: HDMI (High-Definition Multimedia Interface) is a newer type of connection for transmitting digital audio and video signals between devices. Although the AVR 147 is not capable of processing HDMI signals, if your video display is HDMI-capable, you may connect up to two HDMI sources here, and then connect the HDMI output to your video display for improved video performance. It is recommended that you disable the HDMI audio function of your video display, and make a separate digital audio connection from the source device to one of the AVR's coaxial or optical digital audio inputs to benefit from the AVR 147's multichannel audio processing.

The AVR 147 is Simplay HD-verified for compatibility via the HDMI connection with other Simplay HD-verified products.

> **NOTE:** The AVR 147 will not convert other types of video to HDMI, and you will not be able to view the on-screen displays using the HDMI connection.

CD and Tape Audio Inputs: These jacks may be used to connect audio-only source components (e.g., CD player, tape deck). Do not connect a turntable to these jacks unless you are using it with a phono preamp.

Tape Outputs: These jacks may be used to connect a CDR or another audio-only recorder.

Coaxial and Optical Digital Audio Inputs: If your source has a compatible digital audio output, connect it to one of these jacks for improved audio performance. Use only one type of digital audio connection for each source.

Coaxial and Optical Digital Audio Outputs: If a source is also an audio recorder, you may connect a compatible digital audio output to the recorder's input for improved recording quality.

The Bridge/DMP Input: Connect the optional Harman Kardon The Bridge™ to this input for use with your iPod (not included). Make sure the receiver is turned off (in Standby mode) when connecting The Bridge.

6-Channel Inputs: Connect the multichannel analog audio outputs of a DVD-Audio, SACD™, Blu-ray Disc™ or HD-DVD™ player (or any other external decoder) to these jacks to enjoy these proprietary formats.

Component Video Inputs: If both your video source (e.g., DVD player or HDTV tuner) and your television or video display have analog component video (Y/Pb/Pr) capability, then you may connect the component video outputs of your source to one of the two component video inputs. Do not make any other video connections to that source.

Component Video Monitor Outputs: If you are using either of the Component Video Inputs and your television or video display is component-video-capable, you may connect these jacks to the corresponding inputs on your video display. You will also need to connect the composite and/or S-video monitor outputs to your video display if some of your sources use those types of video connections, and to view the AVR 147's on-screen displays.

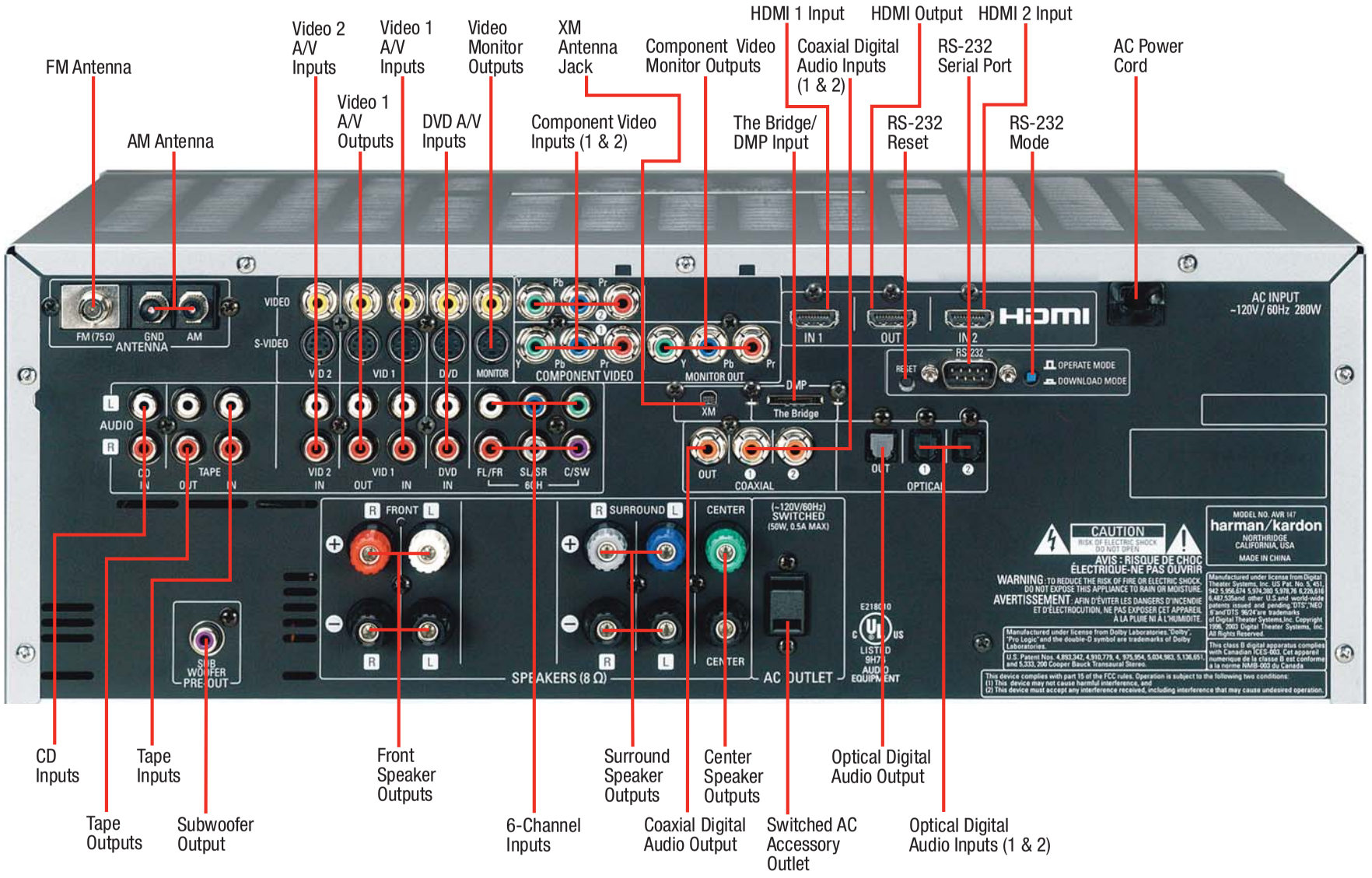
RS-232 Serial Port: This specialized connector may be used with your personal computer in case Harman Kardon offers a software upgrade for the receiver at some time in the future.

RS-232 Mode: Leave this switch popped out in the Operate position unless the AVR 147 is being upgraded.

RS-232 Reset: This switch is only used during a software upgrade. A standard processor reset is performed by pressing and holding the front-panel Tone button.

Switched AC Accessory Outlet: You may plug the AC power cord of one source device into this outlet, and it will turn on whenever you turn on the receiver. Do not use a source that consumes more than 50 watts of power.

AC Power Cord: After you have made all other connections, plug the AC power cord into an unswitched outlet.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

REMOTE CONTROL FUNCTIONS

The AVR 147 remote is capable of controlling up to ten devices, including the AVR itself and an iPod docked in the optional The Bridge accessory. During the installation process, you may program the codes for each of your source components into the remote. Each time you wish to use the codes for any component, first press the Selector button for that component. This changes the button functions to the appropriate codes for that product.

NOTE: Several of the Input Selectors are shared between two devices. The selector button will light in red when the remote is in the device mode printed on the button, and it will light in green for the device mode printed above the button. To switch between the two device modes, press the selector *twice* quickly in succession. The selector will remain in the last-selected mode until the next time you press the selector twice quickly.

For example, the first time you press the DVD button, the button will light up in red, indicating that the remote is in DVD mode. If you press another selector, such as the VID3 selector, and then press the DVD button again, the DVD button will remain red, indicating the remote is still in DVD mode. Now press the DVD button twice quickly. At the first press the button will light red, indicating that the remote is in DVD mode. On the second press the button will turn green, indicating that the remote is now in CD mode. If you press a different selector and return to the DVD/CD Selector, you will observe that the remote is still in CD mode.

Each Input Selector has been preprogrammed to control certain types of components, with only the codes specific to each brand and model changing, depending on which product code is programmed. The device types programmed into each selector may not be changed.

DVD: Controls DVD players and recorders.

CD: Controls CD players and recorders.

Tape: Controls cassette decks.

Video 1: Controls VCRs, TiVo and DVRs.

Video 2: Controls cable and satellite television set-top boxes.

Video 3: Controls televisions and other video displays.

The Bridge/DMP: Controls an iPod docked in The Bridge.

HDMI 1 and 2: Each code set controls a source device (VCR/PVR, DVD player or cable/satellite set-top box) connected to one of these two inputs.

XM: Controls the AVR functions for XM Satellite Radio.

For example, if you have inserted a disc in your CD player and you would like to skip ahead three tracks, but you then find that the volume is too loud, you would follow this procedure:

1. Press the CD Input Selector to switch to the codes that control your CD player.

2. Press the Play Button (in the Transport Controls section) if the disc is not already playing.

3. Press the Skip Up Button three times to advance three tracks.

4. Press the AVR Button so that you can access the Volume Controls.

5. Press the Volume Down Button until the volume level is satisfactory.

Any given button may have different functions, depending on which component is being controlled. Some buttons are labeled with these functions. For example, the Sleep and DSP Surround Buttons are labeled for use as Channel Up/Down Buttons when controlling a television or cable box. See Table A8 in the appendix for listings of the different functions for each type of component.

IR Transmitter Lens: As buttons are pressed on the remote, infrared codes are emitted through this lens. Make sure it is pointing toward the component being operated.

Power On Button: Press this button to turn on the AVR or another device. The Master Power Switch on the AVR 147's front panel must first have been switched on.

Mute Button: Press this button to mute the AVR 147's speaker and headphones outputs temporarily. To end the muting, press this button or adjust the volume. Muting is also canceled when the receiver is turned off.

Program Indicator: This LED lights up or flashes in one of three colors as the remote is programmed with codes.

Power Off Button: Press this button to turn off the AVR 147 or another device.

AVR Selector: Press this button to switch the remote to the codes that operate the receiver.

Input Selectors: Press one of these buttons to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner. This will also turn on the receiver and switch the remote's mode to operate the source device.

XM Radio Button: Press this button to select XM Satellite Radio as the source. You will need to have purchased and activated an XM antenna module, and you will also need to subscribe to the XM Radio service. Visit www.xmradio.com for more information.

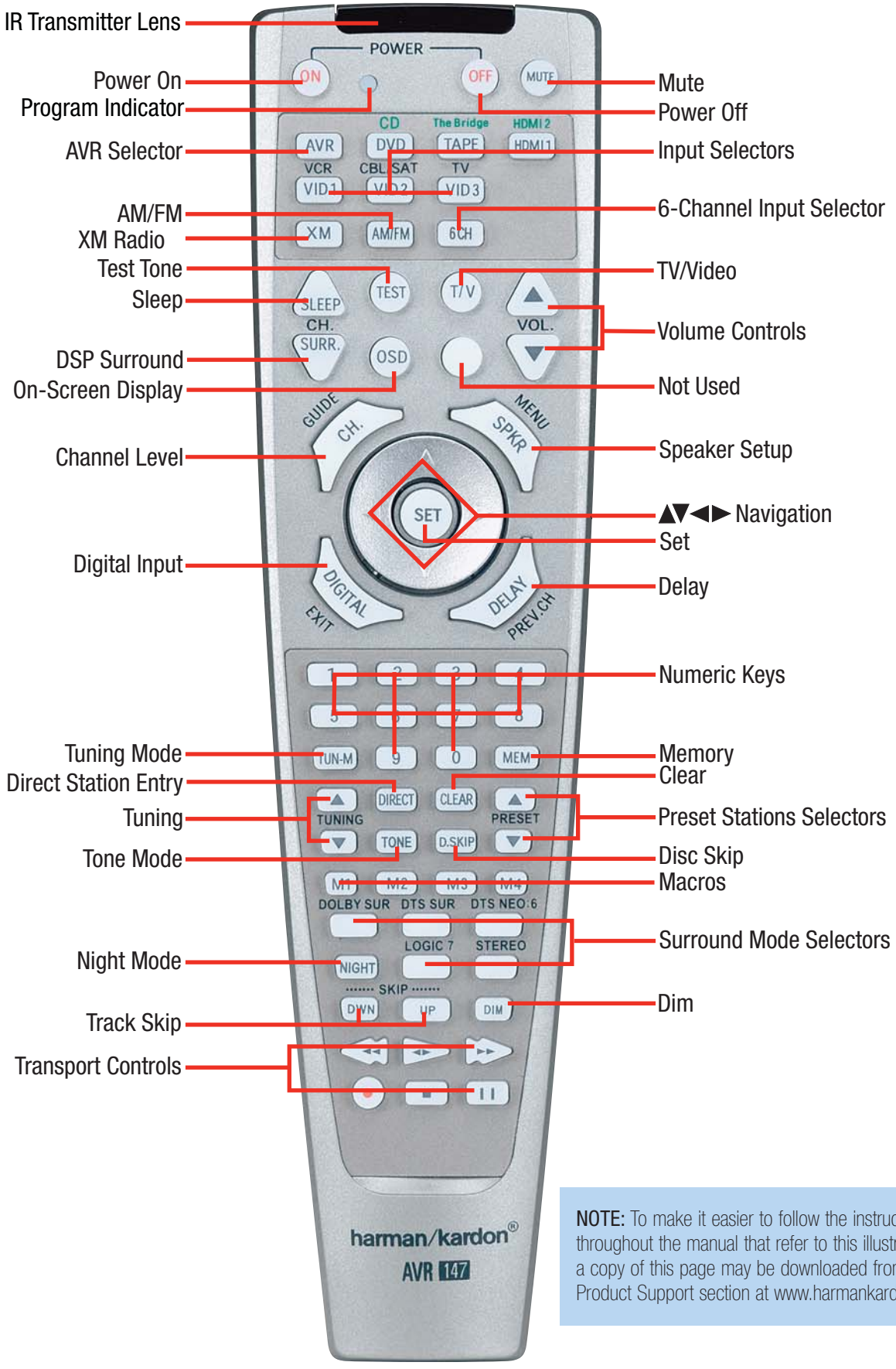
AM/FM Button: Press this button to select the tuner as the source, or to switch between the AM and FM bands, or XM Radio.

6-Channel Input Selector: Press this button to select the 6-Channel Inputs as the audio source. The receiver will use the video input and remote control codes for the last-selected video source.

Test Tone: Press this button to activate the test tone for manual output-level calibration.

TV/Video: This button has no effect on the receiver, but is used to switch video inputs on some video source components.

Sleep Button: Press this button to activate the sleep timer, which shuts off the receiver after a programmed period of time of up to 90 minutes.



NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com.

REMOTE CONTROL FUNCTIONS

Volume Controls: Press these buttons to raise or lower the volume, which will be shown in decibels (dB) in the Message Display.

DSP Surround: Press this button to select a DSP surround mode (Hall 1, Hall 2, Theater).

On-Screen Display (OSD): Press this button to activate the on-screen menu system.

Channel Level: Press this button to set the output levels for each channel so that all speakers sound equally loud at the listening position. Usually this is done while playing an audio selection, such as a favorite CD, after you have calibrated the levels using EzSet/EQ, as described in the Initial Setup section.

Speaker Setup: Press this button to configure speaker sizes, that is, the frequency-range capability of each speaker. Usually this is done using the on-screen menu system, as described in the Initial Setup section.

Navigation ▲/▼/◀/▶ and Set Buttons: These buttons are used together to make selections within the on-screen menu system, or when accessing the functions of the four buttons surrounding this area of the remote – Channel Level, Speaker Setup, Digital Input or Delay.

Digital Input Select: Press this button to select the specific digital audio input (or analog audio input) you used for the current source.

Delay: Press this button to set delay times that compensate for placing the speakers at different distances from the listening position, or to resolve a "lip sync" issue that may be caused by digital video processing. This may also be done using the on-screen menu system, as described in the Initial Setup section.

Numeric Keys: Use these buttons to enter radio station frequencies or to select station presets. When the AM or FM band is in use, press the Direct button before entering the station frequency.

When listening to XM Radio, you may enter channel numbers without first pressing the Direct Button; however, to access the preset stations, you will need to use the Preset Stations Selectors. To access another bank of XM presets, press the Set Button repeatedly until PRESET SEARCH appears, then use the ▲/▼ Buttons to select the letter of the desired bank.

Tuning Mode: When listening to AM or FM radio, this button toggles between manual (one frequency step at a time) and automatic (seeks frequencies with acceptable signal strength) tuning mode. It also toggles between stereo and mono modes when an FM station is tuned.

When listening to XM Radio, press the Tuning Mode Button once to view the category name of the current channel. Additional presses will display the artist, song title and channel name.

Memory: After you have tuned a particular radio station, press this button, then the numeric keys, to save that station as a radio preset.

For XM Radio, the procedure for saving a preset is a little different. To save the current channel in one of the 40 available preset locations, press the Set Button repeatedly until PRESET SEARCH appears. Use the ▲/▼ Buttons to select a letter (A through E) representing one of the five banks of preset memory slots. Then press the Memory button, followed by a Numeric Key (1 through 8) for the precise preset memory location you wish to save the channel in.

Tuning: Press these buttons to tune a radio station or XM Radio channel. For the AM and FM bands, and depending on whether the tuning mode has been set to manual or automatic, each press will either change one frequency step at a time, or seek the next frequency with acceptable signal strength.

Direct: Press this button before using the Numeric Keys to directly enter a radio station frequency (AM or FM bands only).

Clear: Press this button to clear a radio station frequency you have started to enter.

Preset Stations Selector: Press these buttons to select a preset radio station.

For XM Radio, first press the Set Button repeatedly until PRESET SEARCH appears and then use the ▲/▼ Buttons to select the letter of the desired bank of presets.

Tone Mode: Press this button to access the tone controls (bass and treble). Use the Navigation buttons to make your selections.

Disc Skip: This button has no effect on the receiver, but is used with some optical disc changers to skip to the next disc.

Macros: These buttons may be programmed to execute long command sequences with a single button press. They are useful for programming the command to turn on or off all of your components, or for accessing specialized functions for a different component than you are currently operating.

Surround Mode Selectors: Press any of these buttons to select a type of surround sound (e.g., multichannel) mode. Choose from the Dolby modes, DTS modes, Logic 7 modes or Stereo modes. Each press of a button will cycle to the next available variant of that mode. Not all modes or mode groups are available with all sources.

Night Mode: Press this button to activate Night mode with specially encoded Dolby Digital discs or broadcasts. Night mode compresses the audio so that louder passages are reduced in volume to avoid disturbing others, while dialogue remains intelligible.

Track Skip: These buttons have no effect on the receiver, but are used with many source components to change tracks or chapters.

Dim: Press this button to partially or fully dim the front-panel display.

Transport Controls: These buttons have no effect on the receiver, but are used to control many source components. By default, when the remote is operating the receiver, these buttons will control a DVD player.

INTRODUCTION TO HOME THEATER

The AVR 147 may be the first multichannel surround sound receiver you have owned. Although it has more connections and features than two-channel receivers, many of the principles are similar and the new concepts are easy to understand. This introductory section will help you to familiarize yourself with the basic concepts, which will make setup and operation smoother.

If you are already familiar with home theater, you may skip this section and proceed to the Connections section on page 16.

Typical Home Theater System

A home theater typically includes your audio/video receiver, which controls the system; a DVD player; a source component for television broadcasts, which may be a cable box, a satellite dish receiver, an HDTV tuner or simply an antenna connected to the TV; a video display (television); and loudspeakers.

All of these components are connected by various types of cables for audio and video signals.

Multichannel Audio

The main benefit of a home theater system is that several loudspeakers are used in various locations around the room to produce "surround sound." Surround sound immerses you in the musical or film presentation for increased realism.

The AVR 147 may have up to five speakers connected directly to it (plus a subwoofer). Each speaker is powered by its own amplifier channel inside the receiver. When more than two speakers are used, it is called a multichannel system.

- **Front Left and Right –** The main speakers are used the same way as in a two-channel system. However, you may notice that in many surround modes, these speakers are used more for ambient sound while the main action, especially dialogue, is moved to the center speaker.
- **Center –** The center speaker is usually placed above or below the video screen, and is used mostly for dialogue in movies and television programs. This placement allows the dialogue to originate near the actors' faces, for a more natural sound.
- **Surround Left and Right –** The surround speakers are used to improve directionality of ambient sounds. In addition, by using more loudspeakers in the system, more dynamic soundtracks may be played without risk of overloading any one speaker.

  Many people expect the surround speakers to play as loudly as the front speakers. Although all of the speakers in the system will be calibrated to sound equally loud at the listening position, most artists use the surround speakers for ambient effects only, and they program their materials to steer very little sound to these speakers.
- **Subwoofer –** A subwoofer is a special-purpose speaker designed to play only the lowest frequencies (the bass). It may be used to augment smaller, limited-range satellite speakers used for the other channels. In addition, many digital-format programs, such as movies recorded in Dolby Digital, contain a special low-frequency effects (LFE) channel which is directed only to the subwoofer. The LFE channel packs the punch of a rumbling train or airplane, or the power of an explosion, adding realism and excitement to your home theater. Many people use two subwoofers, placed on the left and right sides of the room, for additional power and even distribution of the sound.

Surround Modes

There are different theories as to the best way to present surround sound and to distribute soundtrack information among the various speakers. A variety of algorithms have been developed in an effort to accurately reproduce the way we hear sounds in the real world. The result is a rich variety of surround mode options. Some modes are selected automatically, depending on the signal being received from the source. In many cases, you may select a surround mode manually.

Several companies have taken surround sound in slightly differing directions. It is helpful to group the numerous surround modes either by their brand name, or by using a generic name:

- **Dolby Laboratories, Inc. Modes –** Dolby Digital, Dolby Pro Logic II, Dolby Virtual Speaker, Dolby Headphone
- **DTS Modes –** DTS, DTS Neo:6, DTS 96/24
- **Harman International (Harman Kardon's Parent Company) –** Logic 7
- **DSP Modes –** Generic modes that include Hall 1, Hall 2 and Theater
- **Stereo Modes –** Generic modes that expand upon conventional two-channel stereo, including DSP Surround Off, Analog Bypass Surround Off and 5-Channel Stereo

Table 6 on pages 43 – 45 contains detailed explanations of the differences between the various mode groups, and the mode options available within each group. Digital modes, such as Dolby Digital and DTS, are only available with specially encoded programs, such as DVDs and digital television. Other modes may be used with various digital and analog signals to create a different surround presentation, or to use a different number of speakers. Surround mode selection depends upon the number of speakers in your system, the materials you are watching or listening to, and your personal tastes.
Feel free to experiment.

CONNECTIONS

There are different types of audio and video connections used to connect the receiver to the speakers and video display, and to connect the source devices to the receiver. To make it easier to keep them all straight, the Consumer Electronics Association (CEA) has established a color-coding standard. Table 1 may be helpful to you as a reference while you set up your system.

Table 1– Connection Color Guide

Audio Connections		
	Left	Right
Front **(FL/FR)**		
Center **(C)**		
Surround **(SL/SR)**		
Subwoofer **(SUB)**		
Digital Audio Connections		
Coaxial		
Optical	Input	Output
Video Connections		
Component	Y Pb	Pr
Composite		
S-Video		
HDMI Connections (switching only)		
HDMI		

Types of Connections

This section will briefly review different types of cables and connections that you may use to set up your system.

Speaker Connections

Speaker cables carry an amplified signal from the receiver's speaker terminals to each loudspeaker. Speaker cables generally contain two wire conductors, or leads, inside plastic insulation. The two conductors are usually differentiated in some way, by using different colors, or stripes, or even by adding a ridge to the insulation. Sometimes the actual wires are different, one being copper colored and the other silver.

The differentiation is important because each speaker must be connected to the receiver's speaker-output terminals using two wires, one positive (+) and one negative (–). This is called speaker polarity. It's important to maintain the proper polarity for all speakers in the system. If some speakers have their negative terminals connected to the receiver's positive terminals, performance can suffer, especially for the low frequencies.

Always connect the positive terminal on the loudspeaker, which is usually colored red, to the positive terminal on the receiver, which is colored as shown in the Connection Color Guide (Table 1). Similarly, always connect the black negative terminal on the speaker to the black negative terminal on the receiver.

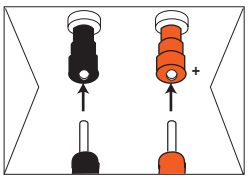


Figure 1 – Binding-Post Speaker Terminals With Banana Plugs

The AVR 147 uses binding-post speaker terminals that can accept banana plugs or bare-wire cables.

Banana plugs are simply plugged into the hole in the middle of the terminal cap. See Figure 1.

Bare wire cables are installed as follows (see Figure 2):

1. Unscrew the terminal cap until the pass-through hole in the collar is revealed.
2. Insert the bare end of the wire into the hole.
3. Screw the cap back into place until the wire is held snugly.

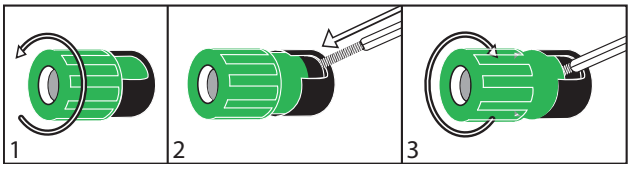


Figure 2 – Binding-Post Speaker Terminals With Bare Wires

Subwoofer

The subwoofer is a specialized type of loudspeaker that is usually connected in a different way. The subwoofer is used to play only the low frequencies (bass), which require much more power than the other speaker channels. In order to obtain the best results, most speaker manufacturers offer powered subwoofers, in which the speaker contains its own amplifier on board. Sometimes the subwoofer is connected to the receiver using the front left and right speaker outputs, and then the front left and right speakers are connected to terminals on the subwoofer. More often, a line-level (nonamplified) connection is made from the receiver's Subwoofer Output to a corresponding jack on the subwoofer, as shown in Figure 3.

Although the subwoofer output looks similar to the analog audio jacks used for the various components, it is filtered and only allows the low frequencies to pass. Don't connect this output to your other devices. Although doing so won't cause any harm, performance will suffer.

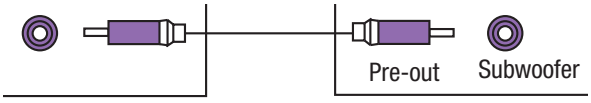


Figure 3 – Subwoofer

Connecting Source Devices to the AVR

The AVR 147 is designed to process audio and video input signals, playing back the audio and displaying the video on a television or monitor connected to the AVR. These signals originate in what are known as "source devices," including your DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television box or MP3 player. Although the tuner is built into the AVR, it also counts as a source, even though no external connections are needed, other than the FM and AM antennas.

Separate connections are required for the audio and video portions of the signal. The types of connections used depend upon what's available on the source device, and for video signals, the capabilities of your video display.

Audio Connections

There are two formats for audio connections: digital and analog. Digital audio signals are of higher quality, and are required for listening to sources encoded with digital surround modes, such as Dolby Digital and DTS. There are two types of digital audio connections: coaxial and optical. Either type of digital audio connection may be used for each source device, but never both simultaneously for the same source. However, it's okay to make both analog and digital audio connections at the same time to the same source.

NOTE: Although HDMI cables are capable of carrying digital audio signals, the AVR 147 is not designed to process those signals. Therefore, if your source and video display are both HDMI-capable, use the HDMI connections for video only. Make a separate audio connection from the source device to the AVR 147, and turn the volume on your TV all the way off.

Digital Audio

Coaxial digital audio jacks are usually color-coded in orange. Although they look similar to analog jacks, they should not be confused, and you should not connect coaxial digital audio outputs to analog inputs or vice versa. See Figure 4.

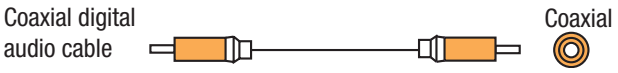


Figure 4 – Coaxial Digital Audio

Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Input connectors are color-coded using a black shutter, while outputs use a gray shutter. See Figure 5.

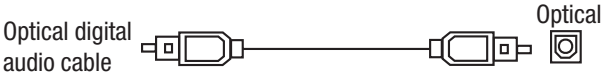


Figure 5 – Optical Digital Audio

Due to the nature of digital signals as binary bits, they aren't subject to signal degradation the way analog signals are. Therefore, the quality of coaxial and optical digital audio connections should be the same, although it is important to limit the length of the cable. Whichever type of connection you choose, Harman Kardon recommends that you always select the highest quality cables available within your budget.

Analog Audio

Analog connections require two cables, one for the left channel (white) and one for the right channel (red). These two cables are often attached to each other for most of their length. See Figure 6. Most sources that have digital audio jacks also have analog audio jacks, although some older types of sources, such as tape decks, have only analog jacks. For sources that are capable of both digital and analog audio, you may wish to make both connections. If you wish to record materials from DVDs or other copy-protected sources, you may only be able to do so using analog connections. Remember to comply with all copyright laws if you choose to make a copy for your own personal use.

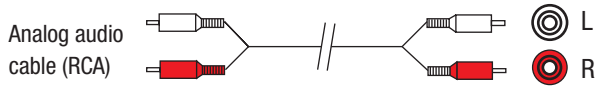


Figure 6 – Analog Audio

Multichannel analog connections are used with some high-definition sources where the copy-protected digital content is decoded inside the source. These types of connections are usually used with DVD-Audio, SACD, Blu-ray Disc, HD-DVD and other multichannel players. See Figure 7.

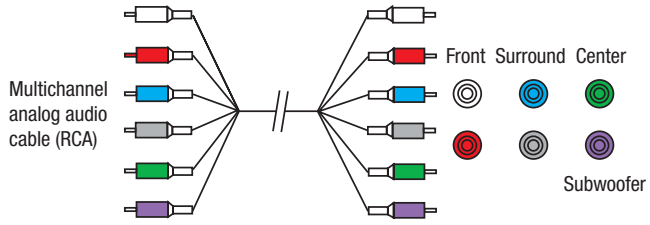


Figure 7 – Multichannel Analog Audio

Harman Kardon receivers also include a proprietary, dedicated audio connection called "The Bridge/DMP". If you own an iPod with a dock connector, you may purchase The Bridge separately and connect it to The Bridge/DMP port on the receiver. See Figure 8. Dock your iPod (not included) in The Bridge, and you may play your materials through your high-performance audio/video system. You may even use the AVR 147 remote to control the iPod, with navigation messages displayed on the front panel and on the screen of a video display connected to the AVR.

Figure 8 – The Bridge

Video Connections

Although some sources produce an audio signal only (e.g., CD player, tape deck), many sources output both audio and video signals (e.g., DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to the audio connection, you will need to connect one type of video connection for each of these sources (never more than one at the same time for any source).

Digital Video

The AVR 147 is equipped with two HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI is capable of carrying digital audio and video information using a single cable, thus delivering the highest possible quality picture and sound.

There are different versions of HDMI, depending on the capability of the source device and the type of signal it is capable of transmitting via the HDMI connection.

In addition, receivers and processors such as the AVR 147 may handle the incoming signal in several different ways, depending on their capability as well. The AVR 147 is only capable of switching the HDMI data. That is, the incoming audio and video data will be passed directly to your HDMI-capable video display, without the AVR 147 processing any

of the data. Although this enables the AVR 147 to be compatible with virtually any HDMI-capable source device and video display, it requires a separate audio connection for each source since the AVR 147 doesn't have access to the audio data in the HDMI stream.

The AVR 147 is Simplay HD-verified for compatibility via the HDMI connection with other Simplay HD-verified products.

The AVR 147 will not convert analog video signals to the HDMI format, and the on-screen displays are not visible when using an HDMI source. Therefore, you will need to connect the composite or S-video monitor output to your video display (or both, depending on which video connections your sources use), to view the on-screen menus.

The physical HDMI connection is simple. The connector is shaped for easy plug-in (see Figure 9). If your video display has a DVI input, you may use an HDMI-to-DVI adapter (not included) to connect it to the AVR's HDMI Output.

Figure 9 – HDMI Connection

Analog Video

There are three types of analog video connections: composite video, S-video and component video.

Composite video is the basic connection most commonly available. The jack is usually color-coded yellow, and looks like an analog audio jack, although it is important never to confuse the two. Do not plug a composite video cable into an analog or coaxial digital audio jack, or vice versa. Both the chrominance (color) and luminance (intensity) components of the video signal are transmitted using a single cable. See Figure 10.

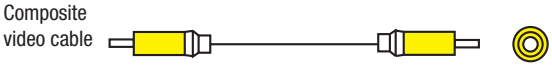


Figure 10 – Composite Video

S-video, or "separate" video, transmits the chrominance and luminance components using separate wires contained within a single cable. The plug on an S-video cable contains four metal pins, plus a plastic guide pin. Be careful to line up the plug correctly when you insert it into the jack on the receiver, source or video display. See Figure 11.

Figure 11 – S-Video

Component video separates the video signal into three components – one luminance ("Y") and two subsampled color signals ("Pb" and "Pr") – that are transmitted using three separate cables. The "Y" cable is color-coded green, the "Pb" cable is colored blue and the "Pr" cable is colored red. See Figure 12.

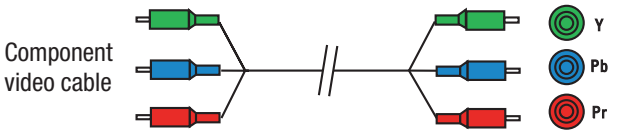


Figure 12 – Component Video

If it's available on your video display, HDMI is recommended as the best quality connection, followed by component video, S-video and then composite video.

NOTE: A composite or S-video connection to your TV is required to view the AVR's on-screen displays.

Antennas

The AVR 147 uses separate terminals for the included FM and AM antennas that provide proper reception for the tuner.

The FM antenna uses a 75-ohm F-connector. See Figure 13.

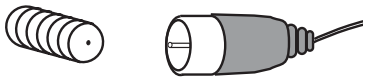


Figure 13 – FM Antenna

The AM loop antenna needs to be assembled. Then connect the two leads to the screw terminals on the receiver. See Figure 14.

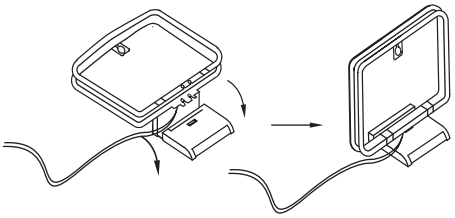


Figure 14 – AM Antenna

RS-232 Serial Port

The RS-232 serial port on the AVR 147 is used only for data. If Harman Kardon releases a software upgrade for the receiver's operating system at some time in the future, the upgrade may be downloaded to the AVR using this port. Complete instructions will be provided at that time.

SPEAKER PLACEMENT

Before you begin to connect cables, it is important to place your speakers in their correct locations in the room.

Optimally, the speakers should be placed in a circle with the listening position at its center. The distance from the listening position to the video display forms the radius of the circle. See Figure 15.

The speakers should be angled so that they directly face the listening position.

The center speaker is placed either on top of, below or mounted on the wall above or below the video display screen.

The front left and right speakers are placed along the circle, about 30 degrees from the center speaker and angled toward the listener.

It is best to place the front left/right and center speakers as close to the same height as possible, preferably at about the same height as the listener's ears. In any event the center speaker should be no more than two feet above or below the left/right speakers.

The side surround speakers should be placed 110 degrees from the center speaker; that is, slightly behind and angled toward the listener. If this isn't feasible, place them behind the listener, with each surround speaker facing the opposite-side front speaker. The surround speakers may be placed a little higher than the listener's ears.

The subwoofer's location is less critical, since low-frequency sounds are omnidirectional. Placing the subwoofer close to a wall or in a corner will reinforce the low frequencies, and may create a "boomy" sound. You may wish to experiment over time by placing the subwoofer where the listener normally sits and then walking around the room until the low frequencies sound best. Place the subwoofer in that spot.

NOTE: Your receiver will sound its best when the same model loudspeaker is used for all positions (other than the subwoofer). If that isn't possible, try to use speakers made by the same manufacturer.

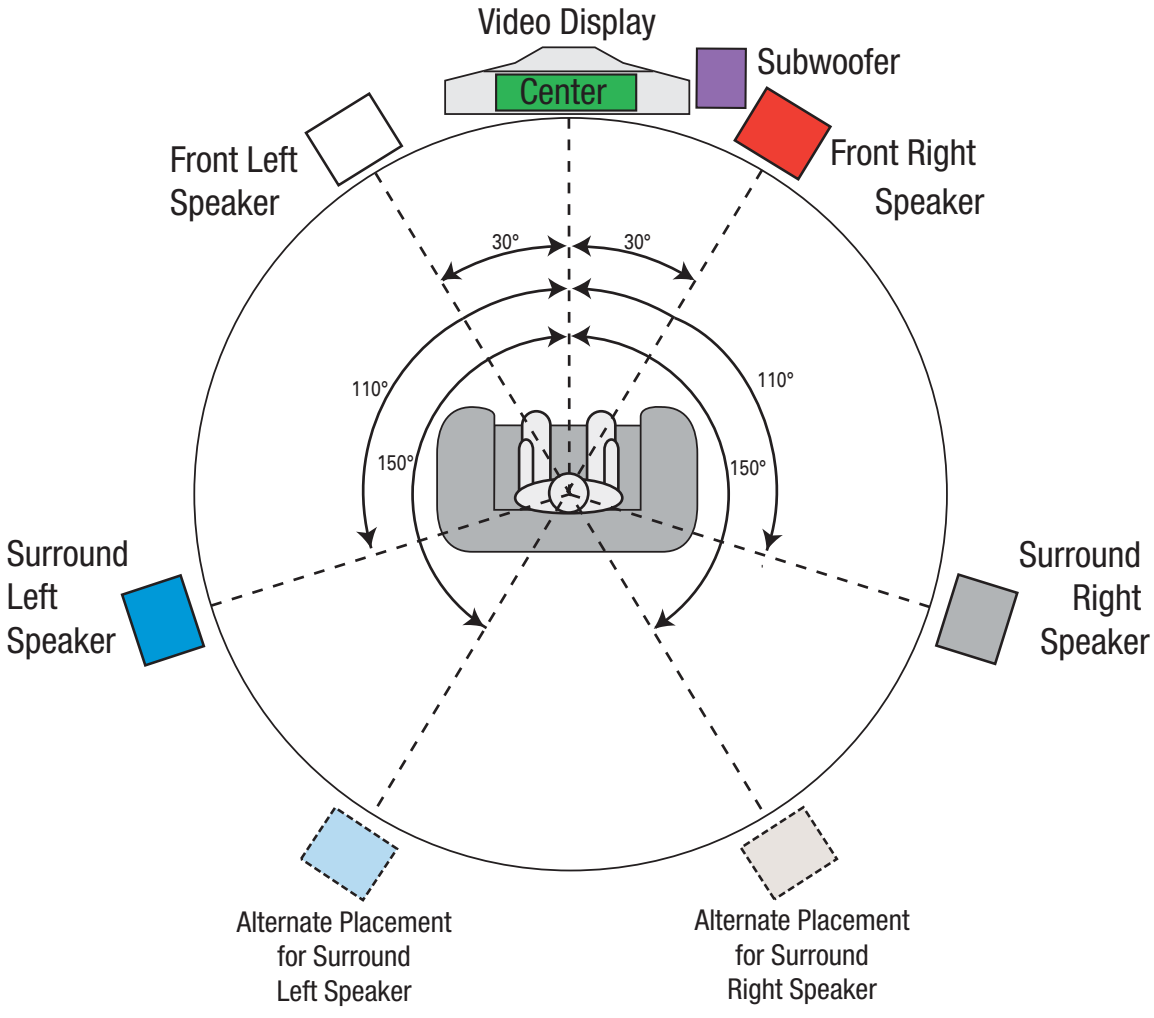


Figure 15 – Speaker Placement

INSTALLATION

You are now ready to connect your various components to your receiver. Before beginning, make sure that all components, including the AVR 147, are turned completely off and their power cords are unplugged. **Don't plug any of the power cords back in until you have finished making all of your connections.**

Remember that your receiver generates heat while it is on. Select a location that leaves several inches of space on all sides of the receiver. It is preferable to avoid completely enclosing the receiver inside a cabinet. It is also preferable to place components on separate shelves rather than stacking them directly on top of the receiver. Some surface finishes are delicate. Try to select a location with a sturdy surface finish.

Step One – Connect the Speakers

If you have not yet done so, place your speakers in the listening room as described in the Speaker Placement section above.

Connect the center, front left, front right, surround left and surround right loudspeakers to the corresponding speaker terminals on the AVR 147. See Figure 16. Remember to maintain the proper polarity by always connecting the positive and negative terminals on each speaker to the positive and negative terminals on the receiver. Use the Connection Color Guide on page 16 as a reference.

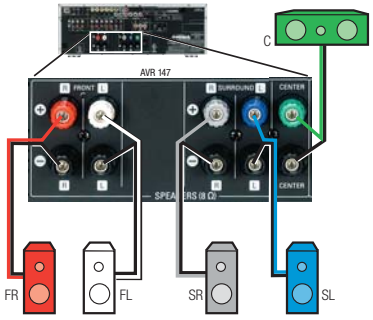


Figure 16 – Speaker Connections

Step Two – Connect the Subwoofer

Connect the Subwoofer Output on the AVR 147 to the line-level input on your subwoofer. See Figure 17. Consult the manufacturer's guide for the subwoofer for additional information.

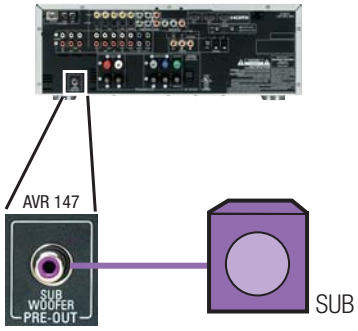


Figure 17 – Subwoofer Connection

Step Three – Connect the Antennas

Connect the FM and AM antennas to their terminals. See Figure 18.

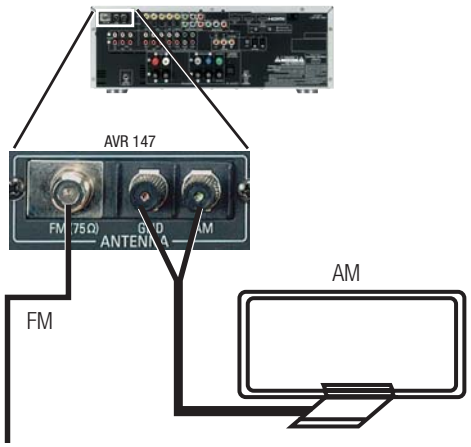


Figure 18 – Antenna Connections

Step Four – Connect the Source Components

Use the Table A4 worksheet in the Appendix to note which connections you will use for each of your source devices.

For each source, select a source input (Video 1, Video 2, Video 3, etc.). In Table 2 we recommend connecting certain types of sources to certain source inputs to make it easier to program and use the remote control.

Decide which audio connections you will use. If your source device has them, use *either* the coaxial digital or the optical digital audio connection. Referring to Table 2, we recommend you connect the DVD source to the Coaxial 1 input jack, and the source designated Video 2 to the Optical 2 input jack. If you are using the HDMI inputs for video switching, then we recommend using the Coaxial 2 digital audio connection for the source connected to the HDMI 1 input, and the Optical 2 digital audio connection for the source connected to the HDMI 2 input.However, you may make whatever connections are best for your system.

In addition to the digital audio connections, we recommend that you connect the analog audio connections for each source, as a backup to the digital connections for recording, or in the event that you use all six of the digital audio inputs for other devices. For sources that don't have digital audio outputs, you must use the analog audio connections.

For each video source, select one type of video connection. HDMI is preferred, but both your source device and your video display must have this type of video capability. If either device does not, then use component video, S-video or composite video.

Referring to Table 2, we recommend that you connect the DVD source to the Component Video 1 inputs, and any one source designated as Video 1, Video 2 or Video 3 to the Component Video 2 inputs. Any HDMI-capable source devices should be connected to one of the two HDMI inputs. All other source devices should be connected to component, the S- or composite video input for that source. However, you may make whatever video connections are best for your system.

NOTE: It's possible for a source to use none of the connections named for that source. For example, you might connect your DVD player to the Component Video 1 inputs and the Coax 1 digital audio input. However, we will refer to this source as "DVD", and in Step Five of the Initial Setup section you will program the receiver so that these connections are assigned to the DVD source. When you select "DVD" as your source using the front panel or the remote, the correct connections for your DVD player will be used.

We recommend connecting your various sources using the connections shown in Table 2 below in order to simplify programming your receiver and remote control. However, you may connect any device to any source input.

Table 2 – Recommended Source Component Connections

Device Type	AVR 147 Source Input	Audio Connections	Video Connections
VCR, DVR, PVR, TiVo® or other audio/video recorder	Video 1	• Video 1 Analog (inputs and outputs) **and** • Any one available coaxial or optical digital audio input with corresponding coax or optical digital output	• *One* of Component Video 2, Video 1 S-video or Video 1 composite video input • For recording, use Video 1 S-video or composite video output, and do not use component video connections at all
Cable TV, Satellite, HDTV or other device that delivers television programs	Video 2	• Video 2 Analog Inputs **and** • Optical 1 Input	• *One* of Component Video 2, Video 2 S-video *or* Video 2 composite video input
TV, game console, camera or other audio/video device	Video 3 (front-panel jacks)	• Video 3 Analog Inputs **and** • *Either* Coax 3 or Optical 3 Input	• *One* of Component Video 2, Video 3 S-video *or* Video 3 composite video input
DVD Audio/Video, SACD, HD-DVD, Blu-ray Disc	DVD	• DVD Analog Inputs • 6-Channel Inputs (optional) **and** • Coax 1 Input	• Component Video 1 Input
CD player	CD	• CD Analog Inputs **and** • Any one available coaxial or optical digital audio input	• Not required
CDR, MiniDisc, cassette	Tape	• Tape Analog (inputs and outputs) **and** • Any one available coaxial or optical digital audio input • Use corresponding coax or optical digital output	• Not required

NOTE: The AVR 147 is equipped with a total of six digital audio inputs, four on the rear panel (Coaxial 1 and 2, Optical 1 and 2) and two on the front panel (Coaxial 3 and Optical 3), which may be assigned to any of the eight source inputs (DVD, Video 1 through 3, HDMI 1 and 2, CD and Tape). We recommend certain digital audio connections simply because, as reflected in Table A1 of the Appendix, those digital audio inputs are assigned to those sources by default at the factory. But any digital audio input may be reassigned to any source. Since you may not be using all eight source inputs, you may reassign a digital audio input that is recommended for a source you aren't using to another device. Table 2 is a guideline; you may need to make adjustments to fit your system.

Video 1 Source

Since this source includes audio and video recording output jacks, it is best suited to a video recorder, such as your VCR or DVR.

Referring to Table 2, connect your recorder to the Video 1 Analog Audio inputs and outputs **and** to any available coaxial or optical digital audio input (and corresponding digital audio output). See Figure 19. Use either the Video 1 S-video or composite video input and output if you wish to make recordings. If you don't plan on recording, you may use the Component Video 2 inputs.

Figure 19 – Video 1 A/V Inputs and Outputs, and Digital Audio Inputs

Remember to connect the audio and video *output* jacks on your recorder to the Video 1 or digital audio *input* jacks on the AVR, and the audio and video *input* jacks on your recorder to the Video 1 or digital audio *output* jacks on the AVR.

NOTE: It isn't possible to make recordings using HDMI or component video connections. Keep this in mind as you connect other source devices that you may wish to make recordings from.

Video 2 Source

The Video 2 source is used only for playback. The AVR 147 remote control is programmed to operate many brands and models of cable and satellite television devices, and we recommend connecting your cable or satellite set-top box to this source.

Referring to Table 2, connect your set-top box to the Video 2 Analog Audio inputs **and** to the Optical 1 Digital Audio input. If possible, use the Component Video 2 inputs. Otherwise, connect the set-top box's S-video or composite video output to the matching Video 2 video input. See Figure 20.

Figure 20 – Video 2 A/V, Digital Audio and Component Video Inputs

Video 3 Source

The Video 3 source is used only for playback. It is also generally reserved for components that are only temporarily connected to the receiver, such as cameras and game consoles, or for your TV to facilitate programming the remote. When not in use, you may place the supplied covers over the front-panel Video 3 jacks for a cleaner appearance. Simply snap the covers in place. When you wish to use the jacks, gently press on the left side of each cover to pivot it out for removal.

Referring to Table 2, connect your TV, camera or game console to the Video 3 Analog Audio inputs **and** to either the Coaxial 3 or Optical 3 digital audio input. See Figure 21. If possible, use the Component Video 2 inputs. Otherwise, connect the devices's S-video or composite video output to the matching Video 3 video input.

Figure 21 – Video 3 A/V and Digital Audio Inputs

NOTE: If you receive your television programming using your TV with an antenna or direct cable connection, connect the TV's analog and optical digital audio outputs (if available) to the Video 3 Analog Audio inputs and to the Coax or Optical 3 Digital Audio input. Do not connect any video output on the television set to any video input on the receiver. See Step Five for information on connecting the receiver's video monitor outputs to the television.

DVD

The DVD source is used for a DVD player. If you have a more advanced multichannel device, such as a Blu-ray Disc or HD-DVD player, connect it to the DVD source.

Referring to Table 2, connect your DVD player to the DVD Analog Audio inputs **and** to the Coaxial 1 Digital Audio input. If possible, use the Component Video 1 inputs. Otherwise, connect the DVD player's S-video or composite video output to the matching DVD video input. See Figure 22.

Figure 22 – DVD A/V, Digital Audio and Component Video Inputs

If your DVD player plays high-resolution audio discs such as SACD or DVD-Audio or when an HD-DVD or Blu-ray Disc player is used, connect the 6-channel analog audio outputs on the DVD player to the 6-channel analog audio inputs on the receiver in order to enjoy these discs to their fullest. See Figure 23.

Figure 23 – 6-Channel Analog Audio Inputs

HDMI 1 Source

The HDMI 1 source is used with a device that is capable of outputting digital video through an HDMI connection, such as a DVD, HD-DVD or Blu-ray Disc player or HDTV tuner. The HDMI 1 source is not used with any of the 2-channel analog audio or video inputs on the AVR 147.

Since the AVR 147 is not capable of processing either the audio or video signal transmitted via the HDMI connection, you will need to connect the source's coaxial digital audio output to the Coaxial 2 digital audio input on the AVR 147, or use the 6-/8-channel inputs. See Figure 24. You will also need to make sure your video display is HDMI-capable, and for many source devices, the display must be HDCP-compliant (High-Bandwidth Digital Content Protection) in order to display copy-protected materials.

The AVR 147 is Simplay HD-verified for compatibility via the HDMI connection with other Simplay HD-verified products.

If your source or video display is equipped with a DVI (Digital Video Interface) input, you may use an HDMI-to-DVI adapter (not included).

Figure 24 – HDMI 1 and Coaxial 2 Inputs

HDMI 2 Source

The HDMI 2 source is used with a second device that is capable of outputting digital video through an HDMI connection, such as a DVD, HD-DVD or Blu-ray Disc player. The HDMI 2 source is not used with any of the 2-channel analog audio or video inputs on the AVR 147.

Since the AVR 147 is not capable of processing either the audio or video signal transmitted via the HDMI connection, you will need to connect the source's optical digital audio output to the Optical 2 digital audio input on the AVR 147, or use the 6-/8-channel inputs. See Figure 25. You will also need to make sure your video display is HDMI-capable, and for many source devices, the display must be HDCP-compliant (High-Bandwidth Digital Content Protection) in order to display copy-protected materials.

If your source or video display is equipped with a DVI (Digital Video Interface) input, you may use an HDMI-to-DVI adapter (not included).

Figure 25 – HDMI 2 and Optical 2 Inputs

CD

The CD source is used for a strictly audio device, such as a CD player.

Referring to Table 2, connect your CD player to the CD Analog Audio inputs **and** to any available digital audio input. See Figure 26.

Figure 26 – CD Audio Inputs and Digital Audio Inputs

No video connections are needed.

Tape

The Tape source is used for audio-only recorders, such as a CDR, MiniDisc or cassette deck.

Referring to Table 2, connect your recorder to the Tape Analog Audio inputs and outputs, and to any available digital audio input (and corresponding digital audio output). See Figure 27.

Figure 27 – Tape Audio Inputs and Outputs, and Digital Audio Inputs and Outputs

Remember to connect the *output* jacks on your recorder to the Tape or digital audio *input* jacks on the AVR, and the *input* jacks on your recorder to the Tape or digital audio *output* jacks on the AVR.

No video connections are needed.

The Bridge™

With Harman Kardon's optional The Bridge, you can enjoy audio, video or still images stored on your iPod (not included), use your AVR 147 remote control to operate the iPod, and even charge the iPod while it's docked in The Bridge.

Simply plug the proprietary cable from The Bridge into the special The Bridge/DMP connector on the rear of the AVR 147. See Figure 28. Refer to the owner's manual for The Bridge to select the appropriate insert to match your iPod.

Figure 28 – The Bridge/DMP Connector

Step Five – Connect the Video Display

Only video connections should be made between the receiver and your video display (TV), unless your TV is the source for your television programming (see Video 3 Source above).

You will need to make a video connection for each type of video used for your sources. In addition, even if you didn't use S-video or composite video for any of your sources, one of these video monitor connections is required to view the AVR 147's on-screen menus and displays.

First, determine what types of video your display is capable of handling. Remember that HDMI is preferred, followed by component video, S-video and then composite video. Ideally, this guided you in selecting the video connections for your sources.

Next, note which types of video connections you used for your source devices. Make sure you didn't use a better type of video connection for a source than your video display can handle. If so, you will need to disconnect the source and use a video connection that's compatible with your display.

If you used an HDMI video connection for any of your sources, then connect the HDMI Output on the AVR to an HDMI input on your video display. See Figure 29. As mentioned previously, you will need to make a separate digital audio connection from each source device to the AVR 147, and you will also need to consult the owner's guide for your television to learn the proper procedure for disabling or muting the audio.

Figure 29 – HDMI Output

If you used component video for any sources, connect the Component Video Monitor outputs on the receiver to one set of component video inputs on your display. See Figure 30. Make a note of how these inputs are labeled on the display.

Figure 30 – Component Video Monitor Outputs

If you used S-video for any sources, or if all of your sources used HDMI or component video, connect the S-video Monitor output on the receiver to an S-video input on your display. See Figure 31. Make a note of how the input is labeled.

If you used composite video for any sources, connect the composite video Monitor output on the receiver to a composite video input on the display. See Figure 31. Again, make a note of how this input is labeled on the display.

Figure 31 – S-Video and Composite Video Monitor Outputs

Consult the manual for your TV to make sure you understand how to select each video input. As you play different source devices that use different types of video connections, select the correct video input on your video display.

Step Six – Plug in AC Power

Having made all of your wiring connections, it is now time to plug each component's AC power cord into a working outlet.

You may plug one device into the AC Switched Accessory Outlet on the rear of the AVR 147. See Figure 32. Make sure this device draws no more than 50 watts. The device should have its mechanical or master power switch turned on, and it will power on any time the AVR 147 is turned on.

Figure 32 – Switched AC Accesssory Outlet

Before plugging the AVR 147's AC Power Cord into an electrical outlet, make sure that the Master Power Switch on the front panel is popped out so that the word OFF appears on its top. Gently press the button to turn the switch off. This will prevent the possibility of damaging the AVR in case of a transient power surge.

Step Seven – Insert Batteries in Remote

The AVR 147 remote control uses three AAA batteries, which are included.

To remove the battery cover located on the back of the remote, firmly press the ridged depression and slide the cover toward the top of the remote.

Insert the batteries as shown in Figure 33, making sure to observe the correct polarity.

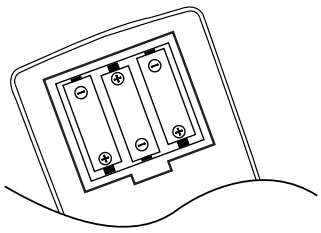


Figure 33 – Remote Battery Compartment

When using the remote, remember to point the lens toward the front panel of the AVR 147. Make sure no objects, such as furniture, are blocking the remote's path to the receiver. Bright lights, fluorescent lights and plasma video displays may interfere with the remote's functioning. The remote has a range of about 20 feet, depending on the lighting conditions. It may be used at an angle of up to 30 degrees to either side of the AVR.

If the remote seems to operate intermittently, or if pressing a button on the remote does not cause the AVR Selector or one of the Input Selectors to light up, then make sure the batteries have been inserted correctly, or replace all three batteries with fresh ones.

Step Eight – Program Sources Into the Remote

The AVR 147 remote not only is capable of controlling the receiver, but it may also be programmed to control many brands and models of VCRs, DVD players, CD players, cable boxes, satellite receivers, cassette decks and TVs, as well as an iPod docked in The Bridge.

It may help to think of the remote as a book with pages. Each page represents the button functions for a different device. In order to access the functions for a particular device, you first need to "turn to that page"; that is, switch the remote to that device mode. This is done by pressing the AVR Button to access the codes that control the receiver, or the Input Selector buttons to access the codes for the devices programmed into the remote.

You may have noticed that three of the Input Selectors look different from the others (see Figure 34). For the DVD/CD, TAPE/The Bridge and HDMI 1/HDMI 2 Selectors, there is a primary source, whose name is printed on the button, and a secondary source, whose name is printed in green above the button.

When the remote is in the device mode for the primary source, e.g. DVD, pressing the device selector will cause it to light up in red. When the remote is in the secondary source's device mode, the selector will light up in green when pressed.

To switch between the primary and secondary device modes, press the selector twice quickly in succession. The selector will retain this selection until the next time you toggle between the primary and secondary device modes. That is, if you press the DVD/CD Selector twice quickly so that the CD source is activated, then press another source selector, such as Video 1, the next time you press the DVD/CD Selector, the remote will return to the CD device mode.

The AVR 147's remote is factory-programmed to control an iPod docked in The Bridge and many Harman Kardon DVD and CD players.

If you have other source devices in your system, follow these steps to program the correct codes into the remote.

1. Using the codes in Tables A9–A16 of the Appendix, look up the product type (e.g., DVD, cable TV box) and the brand name of your source. The number(s) listed are potential candidates for the correct code set for your particular device.

2. Turn on your source device.

3. This step places the remote in program mode, and varies slightly, depending on which Input Selector is being programmed. Refer to Figure 34.

   a) **DVD, Tape, Video 1, Video 2 and Video 3 Sources:** Press and hold the Input Selector until the Program Indicator LED starts to flash, then release it. Follow the directions in Step 4, below.

   b) **CD Source:** Press the DVD/CD Input Selector twice quickly so that it turns green, hold it until the Program LED starts to flash, then release. Follow the directions in Step 4, below.

   c) **HDMI 1 Source:** Press and hold the Input Selector until it turns red and the Program LED starts to flash, then release it. Next, press the Input Selector that corresponds to the device type you want to program into the HDMI 1 mode, i.e., DVD, VCR/PVR or CBL/SAT. Then follow the directions in Step 4, below.

   d) **HDMI 2 Source:** Press and release the Input Selector once, then quickly press the Input Selector again so that it turns green. Hold it until the Program LED starts to flash, then release it. Next, press the Input Selector that corresponds to the device type you want to program into the HDMI 2 mode, i.e., DVD, VCR/PVR or CBL/SAT. Then follow the directions in Step 4, below.

Figure 34 – Input Selectors

4. Enter a code from Step 1 above.

   a) If the device turns off, then press the Input Selector again to accept the code, which will flash. The remote will exit the Program mode.

   b) If the device does not turn off, try entering another code. If you run out of codes, you may search through all of the codes in the remote's library for that product type by pressing the ▲ or ▼ button repeatedly until the device turns off. When the device turns off, enter the code by pressing the Input Selector, which will flash. The remote then exits Program mode.

5. Once you have programmed a code, it's a good idea to try using some other functions to control the device. Sometimes manufacturers use the same Power code for several different models, while other codes will vary. You may wish to repeat this process until you've programmed a satisfactory code set that operates most of the functions you frequently use.

6. You may find out which code number you have programmed by pressing and holding the Input Selector to enter the Program mode. Then press the Set Button, and the Program Indicator LED will flash in the code sequence. One flash represents "1," two flashes for "2," and so forth. A series of many fast flashes represents "0." Record the codes programmed for each device in Table 3.

Table 3 – Remote Control Codes

Source Input	Product Type (circle one)	Remote Control Code
Video 1	VCR, PVR	
Video 2	Cable, Satellite	
Video 3	TV	
HDMI 1	VCR, PVR, DVD, Cable, Satellite	
HDMI 2	VCR, PVR, DVD, Cable, Satellite	
DVD	DVD	
CD	CD, CDR	
Tape	Cassette	

If you're unable to locate a code set that correctly operates your source device, it will not be possible to use the AVR remote to control that device. However, you may still connect the source to the AVR 147 and operate it using the device's original remote control. Alternatively, you may wish to consider purchasing Harman Kardon's optional TC 30 activity-based remote, which is programmed by accessing a large database of product codes on the Internet. The TC 30 is also capable of "learning" codes from your device's original remote.

Most of the button labels on the remote describe the button's function when used to control the AVR 147. However, the button may perform a very different function when used to control another device. Refer to the Remote Control Function List, Table A8 in the Appendix, for each button's functions with the various product types.

If you wish, you may program Macros, which are preprogrammed code sequences that execute many code commands with a single button press. You may also program "punch-through" codes, which allow the remote to operate the volume, channel or transport controls of another device without having to switch the remote's device mode. See pages 50 through 51 for instructions on these advanced programming functions.

NOTE: The AVR 147 remote is preprogrammed to operate the transport controls of Harman Kardon DVD players when the AVR or the Video 2 (cable/satellite) or Video 3 (TV) source is selected. You may change this punch-through programming at any time.

Step Nine – Turn On the AVR 147

Two steps are required the first time you turn on the AVR 147.

1. Gently press the Master Power Switch until the word OFF is no longer visible. The Power Indicator above the two power switches should light up in amber, indicating that the AVR is in Standby mode and is ready to be turned on. See Figure 35. Normally, you may leave the Master Power Switch in the ON position, even when the receiver is not being used.

Figure 35 – Power Switches

2. There are several ways in which the AVR 147 may be turned on from Standby mode.

   a) Press the Standby/On Switch on the front panel. See Figure 35.

   b) Press the Source Select Button on the front panel. See Figure 36.

Figure 36 – Source Select Button

   c) Using the remote, press any one of these buttons: AVR, DVD/CD, TAPE/The Bridge, HDMI 1/HDMI 2, VID1, VID2, VID3, XM, AM/FM or 6CH. See Figure 37.

Figure 37 – AVR and Input Selectors

NOTE: Any time you press one of the Input Selectors on the remote (i.e., DVD/CD, TAPE/The Bridge, HDMI 1/HDMI 2, VID1, VID2 or VID3), the remote will switch modes so that it will only transmit the codes programmed to operate that device. In order to control the receiver, you will need to press the AVR button to return the remote to AVR mode.

Before you begin enjoying your new receiver, a few adjustments should be made to configure the AVR 147 to match your actual system.

Make sure that you have connected a video display to either the S-video or composite video monitor output on the receiver. When you turn on your display and the AVR, you should see a blue screen. A message may appear briefly at the bottom of the screen. This message is part of the on-screen display system, and is referred to as the "semi-OSD". The semi-OSD is activated any time you send a command to the AVR, and any time the AVR detects a change in the incoming signal. Semi-OSD messages are overlaid on top of any video signal, so that you may continue to watch your program while making adjustments to the AVR.

Although it's possible to configure the AVR using only the remote and the semi-OSD messages, we recommend that you use the full-screen menu system, known as the "full-OSD".

Using the On-Screen Menu System

The full-OSD system is accessed by pressing the OSD Button on the remote. See Figure 38. While the full-OSD system is in use, it isn't possible to see any video programming. In addition, an OSD ON message will appear on the front panel of the receiver to remind you to use a video display.

Figure 38 – Navigation Buttons

The Master Menu will always be displayed when you first press the OSD Button. Use the ▲/▼ Buttons on the remote to point the cursor to different lines in the menu. Press the Set Button on the remote to select a line that has no setting to be adjusted, such as one of the sub-menus listed in the Master Menu, or a line that returns you to a previous menu. Within the submenus, after you have positioned the cursor at a particular line item, use the ◀/▶ Buttons on the remote to change a setting. When the desired setting appears, use the ▲/▼ Buttons to navigate to another line item. Except for the TITLE setting in the INPUT SETUP menu, there is no need to press the Set Button after your desired setting appears.

NOTE: The ◀/▶ and Set Buttons on the front panel have no effect on the OSD system.

The Master Menu allows access to five submenus: Input Setup, Surround Select, EzSet/EQ, Manual Setup and System Setup. See Figure 39.

Figure 39 – Master Menu Screen

If you are an experienced home theater user, you may prefer to use the menus in this order:

1. System Setup (described in Advanced Functions section)
2. EzSet/EQ (described in this section)
3. Manual Setup (described here and in Advanced Functions)
4. Input Setup (described in this section)
5. Surround Select (see Advanced Functions section)

We recommend that most users follow the instructions in this INITIAL SETUP section to configure a basic home theater system. You may return to these menus at any time to make additional adjustments.

This section requires that you complete all of the steps in the Installation section that apply to your receiver. You should have connected all of your loudspeakers and a video display, as well as your source devices. You should be able to turn on the receiver and view a blue screen on your video display. If necessary, reread the Installation Section before continuing.

Configure the AVR 147 Using EzSet/EQ

One of the most important and perhaps often overlooked aspects of setting up a home theater system is calibrating the receiver to match the loudspeakers, which enables the AVR to perform at its best.

Until recently, most receivers required the user to perform the calibration and configuration manually, a somewhat tedious process that called for a good ear or the purchase of an SPL (sound-pressure level) meter. Although you may configure the AVR 147 manually, as described in the Advanced Features section, we recommend that most users take advantage of our signature EzSet/EQ system.

INITIAL SETUP

Before beginning, eliminate extraneous background noise that might affect the results, such as noisy air conditioning. Try to avoid making any loud noises while running EzSet/EQ.

IMPORTANT SAFETY NOTE: During the EzSet/EQ procedure, a series of very loud test tones will be played through all of the speakers. Avoid sitting or standing close to any one speaker during the procedure. If you are particularly sensitive to loud noises, you may wish to leave the room and have someone else run EzSet/EQ.

Step One – Place the included EzSet/EQ microphone in the listening position, or in the center of the room, at about the same height as the listeners' ears. The microphone features a threaded insert on the bottom so that it can be mounted on a camera tripod for stability. An extender rod is also included.

Step Two – Plug the EzSet/EQ microphone into the Headphone Jack/EzSet Microphone Input Jack on the front of the receiver. See Figure 40.

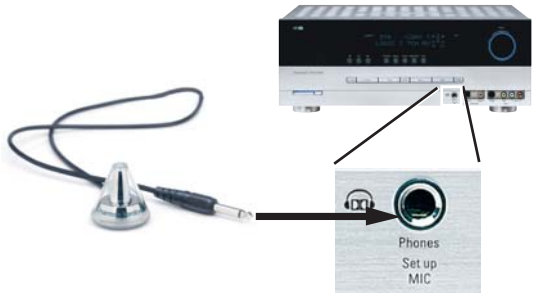


Figure 40 – Plug EzSet/EQ microphone into receiver.

Step Three – Make sure that the AVR 147 and the video display are turned on. Press the OSD Button to display the Master Menu. See Figures 38 and 39. Use the ▲/▼ Buttons to move the cursor to the EzSet/EQ line, and then press the Set Button to select the EzSet/EQ menu. See Figure 41.

Figure 41 – EzSet/EQ Menu Screen

The cursor will be next to the word YES. Press the Set Button to begin EzSet/EQ.

Step Four – If you forgot to plug in the microphone, a message will flash at the bottom of the screen. If the microphone has been plugged in, a warning message will appear and remain on screen for several seconds (see Figure 42).

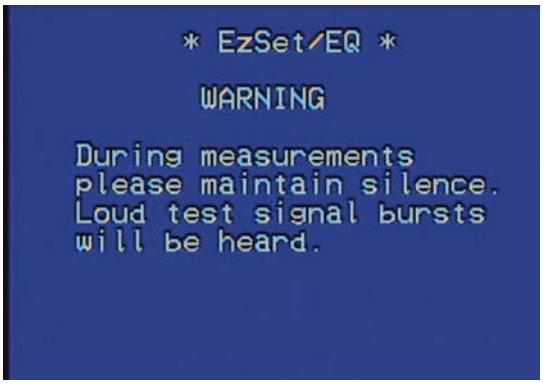


Figure 42 – EzSet/EQ Warning Screen

Please be patient until the warning screen is replaced by the main EzSet/EQ screen. See Figure 43.

Figure 43 – EzSet/EQ Main Screen

The cursor will be pointing to the word MEASUREMENT at the top of the screen. Use the ◀/▶ Buttons on the remote to select START. See Figures 44 and 45.

Figure 44 – EzSet/EQ – Specifying a 5.1 System

Figure 45 – EzSet/EQ – Specifying a 7.1 System

Press the Set Button when the correct system configuration appears, and EzSet/EQ will do the rest automatically!

NOTE: You may interrupt the EzSet/EQ process at any time after the initial warning screen shown in Figure 42 disappears. Press the ▼ Button on the remote, and the cursor will move to the BACK TO MASTER MENU line, giving you an opportunity to exit the on-screen menu system

What EzSet/EQ Does

EzSet/EQ will send test signals to the various speakers and perform the measurements described in this section, adjusting the AVR 147's settings to match EzSet/EQ's internal references.

Set Master Volume Level: EzSet/EQ sends test tones to the front speakers and adjusts the system's volume level to enable it to take the remaining measurements correctly. Your screen may look something like the one shown in Figure 46.

Figure 46 – EzSet/EQ – Setting Master Volume Level

Speaker Check: EzSet/EQ sends test tones to each speaker channel, based on whether you specified a 5.1- or 7.1-channel system in Step Four. Your screen may look something like the one shown in Figure 47 during the speaker check, with the channel being checked at that moment displayed on the second line. You should hear the test tone from the same speaker displayed on screen. If the tone is not coming from the correct speaker, press the ▼ Button on the remote to stop EzSet/EQ. The cursor will move to the BACK TO MASTER MENU line, giving you an opportunity to exit the on-screen menu system and turn off the AVR so that you can check your speaker connections.

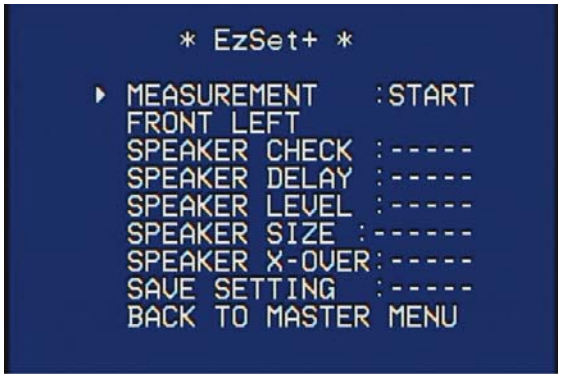


Figure 47 – EzSet/EQ – Speaker Check

NOTE: EzSet/EQ can only detect the presence of a speaker, not its location within the room. If your speakers are not placed reasonably close to the positions shown in Figure 15 in the Speaker Placement Section on page 19, then EzSet/EQ may not be able to perform this test correctly.

If EzSet/EQ detects only one speaker in a pair (e.g., surround back left but no surround back right or no main speakers), it will generate an error and stop, displaying a screen similar to Figure 48. If that happens, check that you have placed your speakers in their correct locations, and that you have wired each speaker to its correct set of speaker terminals.

* ERROR *
Where NONE is shown
please check speaker
or connections.
FL : NONE SBR: YES
CEN: YES SBL: YES
FR : NONE SL : NONE
SR : NONE SUB: YES
BACK TO MASTER MENU

Figure 48 – EzSet/EQ – Error in Speaker Check

Speaker Delay: During this test, EzSet/EQ measures the distance from each speaker to the listening position. If the speakers are placed at different distances from the listener, the sound from speakers placed closer needs to be delayed so that it reaches the listener at the same time as the sounds from the other speakers. This preserves the clarity and directionality of surround sound presentations. The result of the Speaker Delay test will appear on screen as a distance, similar to what is shown in Figure 49.

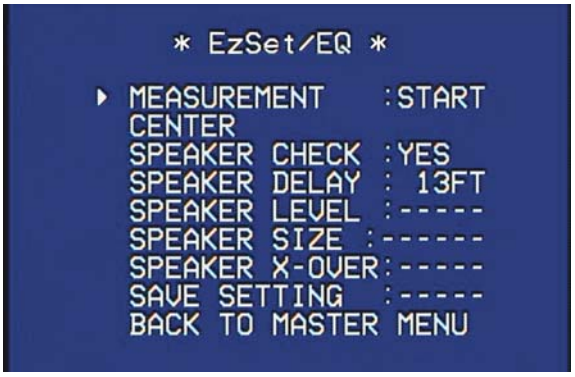


Figure 49 – EzSet/EQ – Speaker Delay

NOTE: The AVR 147 is also capable of setting a different type of delay, called A/V Sync Delay. A/V Sync Delay is used to compensate for lip sync problems that may occur when a video display device or set-top box causes delays while digital video signals are processed. It simultaneously adds a delay to all speaker channels in the system. A/V Sync Delay is not set during EzSet/EQ. It may be set while watching a program as follows: press the Delay Button on the remote and the first setting displayed is A/V Sync Delay. Press the Set Button to select it and then use the ▲/▼ Buttons to adjust it.

Speaker Level: During this test, EzSet/EQ ensures that all speakers sound equally loud at the listening position. During a surround sound presentation, it is common, at times, for the surround channels to sound less prominent, or not to be used at all. By setting the baseline channel levels correctly, the settings programmed by the director can be even more effective.

Speaker Size: This test checks the low-frequency range capabilities of each of your speakers to ensure that low-frequency sounds are not sent to speakers unable to reproduce them efficiently. Each of the main speakers in your system will be assigned a value of Large or Small, depending solely on how it handles low frequencies.

Speaker Crossover: This test determines the lowest frequency each of your main speakers is capable of handling effectively, in order to set the highest frequency the subwoofer should reproduce. The system balances the need to ensure that all frequencies are reproduced for smooth transitions between the subwoofer and main speakers without losing any information, against the need to avoid overtaxing smaller satellite speakers.

Equalization (EQ): Many factors unique to the listening room can affect the overall sound of a home theater system. For example, a room consisting of hardwood floors and large expanses of glass can sound livelier, with added reverberation, while a carpeted room fitted with draperies can dampen sound waves. In addition, the shape of the room can affect frequency response. If a room has a small alcove near a doorway, for example, you may notice a difference in bass response depending on whether you are standing opposite the alcove or to one side of it.

EzSet/EQ is capable of measuring the impact room characteristics and speaker placement have on each speaker's performance, and of making adjustments to low-frequency response to compensate. You may hear EzSet/EQ repeat tones from various speakers a number of times as it performs the equalization.

When EzSet/EQ has finished running all of these tests, a screen similar to the one in Figure 50 will appear. The TEST DONE-UNPLUG MIC message will disappear after a few seconds, replaced by a speaker channel name. You may move the cursor to that line and scroll through the speaker channels to review the EzSet/EQ results. If they are satisfactory, return the cursor to the SAVE SETTING line, and press the Set Button to save the EzSet/EQ settings. If the settings are close but you would like to tweak them, save the EzSet/EQ settings and then follow the instructions in the Advanced Functions section to manually adjust the various configuration settings. If the settings are completely unsatisfactory, use the ◀/▶ Buttons to select NO and press the Set Button. Check your speaker connections and placements, then repeat EzSet/EQ.

Figure 50 – EzSet/EQ – Completed

Configure Sources

This is the last step in the configuration process. In the Installation section, you physically connected various cables between your source devices and the AVR. In this section, you will assign the various audio and video inputs to their sources, ensuring that the AVR uses the correct connections each time you select a source.

Press the OSD Button to view the Master Menu. The cursor will be pointing to the INPUT SETUP line, and you need only press the Set Button to display the Input Setup menu. See Figure 51.

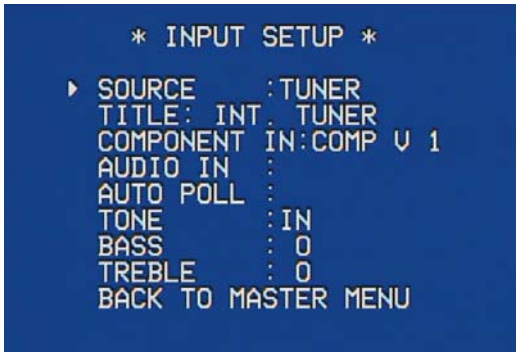


Figure 51 – Input Setup Menu Screen

The first line indicates that the receiver is currently set to the tuner source. In fact, you may hear static if the tuner is set to an unused frequency. You will not be able to make any changes to the tuner, other than selecting a component video input or adjusting the tone controls. It is not recommended that you make either of these changes for the tuner at this time.

Press the ◀ Button to view the next source. The sources will be selected in the following order: Tape, 6-Channel Inputs, XM Radio, DMP/The Bridge, Video 1, Video 2, Video 3, HDMI 2, HDMI 1, DVD and CD. Pressing the ▶ Button selects the sources in the reverse order.

For each of these sources, you may adjust the following settings. At a minimum, you should make sure that sources connected to any of the component video or digital audio inputs have the correct settings. Other settings are optional, and you may adjust them at a later time when you have more experience with the AVR. Refer to the Table A4 worksheet in the appendix that you filled out during installation as you assign inputs to each source.

TITLE: You may change the display name for any source (except the tuner). Not only does this enable you to customize your system; it helps you to select the correct source device even when you have forgotten which physical connections you used.

Move the cursor down to the TITLE line and press the Set Button. A block cursor will blink. See Figure 52.

Figure 52 – Retitling a Source Input

Now you may use the ▲/▼ Buttons to scroll through the alphabet in upper and lower case, as well as numbers and a variety of punctuation marks. When you have selected the desired character, press the ▶ Button to move to the next space. You may also press the ▶ Button to leave a blank. Press the Set Button when you have finished spelling out the new display name for the source.

COMPONENT IN: If you connected the source to one of the two component video inputs, make sure the correct set of inputs is displayed at this line. If it isn't, move the cursor to this line, and then press the ▶ Button to change the setting.

AUDIO IN: By default, the analog audio inputs are assigned to all sources at the factory, with the following exceptions:

Table 4 – Default Digital Audio Assignments

Source Input	Default Digital Audio Input
DVD	Coax 1
Video 2	Optical 1
HDMI 1	Coax 2
HDMI 2	Optical 2

If you used a digital audio connection for another source, change this setting to assign the correct digital audio input to the source, even if you also connected the analog audio outputs of the source to the receiver. Move the cursor to this line, and press the ◀/▶ Buttons until the correct digital input appears.

AUTO POLL: The Auto Poll feature is used when both an analog audio and digital audio connection have been made for one source device. If for some reason no digital signal is available, the AVR 147 will switch to the analog inputs for the source. This situation can occur with some cable or satellite television broadcasts, where some channels are broadcast with digital audio and others with analog audio.

For some sources, the Auto Poll feature is unnecessary and may be undesirable. For example, if your DVD player is stopped, you may not want to use the analog audio signal or you may have decided not to connect analog audio. Move the cursor to this line, and press the ◀/▶ Buttons until OFF appears, disabling the Auto Poll feature. With Auto Poll turned off, the receiver will only check for a signal at the audio input assigned to the source.

DMP SETTING: If you select DMP/The Bridge as your source input, you will notice that the AUDIO IN line of the INPUT SETUP menu has been replaced by the option GO TO DMP SETTING. See Figure 53.

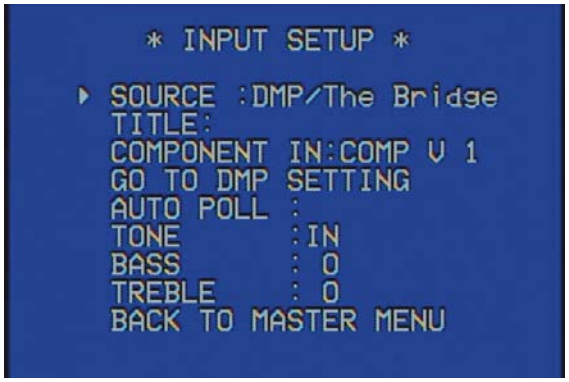


Figure 53 – Input Setup Menu Screen for DMP/The Bridge source

Since The Bridge is connected to the AVR using a dedicated connection, it isn't possible to select a different audio input for this source. However, there are several special settings used only with The Bridge. Selecting GO TO DMP SETTING displays the DMP SETTING menu (see Figure 54).

INITIAL SETUP

Figure 54 – DMP Setting Menu Screen

MODE: The first line of the DMP SETTING menu allows you to select whether the iPod will be used to listen to music (or other audio materials), or view videos or still images, if you have a video or photo iPod.

REPEAT: Set REPEAT to ONE, ALL or OFF to repeat one track, all tracks in an album or playlist, or not to repeat any tracks.

SHUFFLE: Set SHUFFLE to SONGS to play all songs on the iPod in random order. The ALBUMS setting plays all albums in random order, with each album's tracks played in album order.

RESUME: Set RESUME to ON to resume playback of a track from the point where it was interrupted by turning off the AVR, switching sources on the AVR, or removing the iPod from The Bridge. Set RESUME to OFF if you wish to restart play from the beginning of the track after interruptions.

NOTE: The Resume setting disables the Remember Playback Position setting that you may set for audio and video files using later versions of iTunes. Resume affects all files on the iPod until you manually change the setting either in the DMP SETTING menu or by using iTunes.

CHARGE IN ST-BY: Your iPod battery may be charged while it is docked in The Bridge with the AVR turned on. Set CHARGE IN ST-BY to ON to enable charging even when the AVR is in Standby mode (but not completely off). When CHARGE IN ST-BY is set to OFF, the iPod will charge only when the AVR is turned on.

NOTE: To access the DMP SETTING menu, press the AVR Selector on the remote so that it operates the AVR 147. You may then press the OSD Button and use the Navigation and Set Buttons, as usual, with the on-screen menu system. When you are ready to return to operation of your iPod using the remote, remember to press the DMP/The Bridge Selector so that the transport and other controls operate The Bridge.

To simplify use, you may wish to program two macros on your remote, one to select the AVR and issue the commands within the OSD system to display the DMP SETTING menu, and a second macro to remove the menu from the display and return the remote to operation of The Bridge. See the Macros section of the Advanced Functions section of this manual for more information on programming macros.

The remaining lines in the Input Setup menu activate the tone controls, and may be skipped at this time. We recommend leaving the tone controls at their factory defaults for most listening, in order to enjoy the sound mix created by your favorite movie and music artists. However, if your room or speakers have unusual characteristics, or simply as a matter of personal preference, see the Tone Controls section on page 34 for more information.

You are now ready to begin enjoying your new receiver!

Now that you have installed your system components and completed at least a basic configuration of your receiver, you are ready to begin enjoying your home theater system.

Turning On the AVR 147

Gently press the Master Power Switch until the word OFF is no longer visible. The Power Indicator above the two power switches should light up in amber. This indicates that the AVR is in Standby mode and is ready to be turned on. Normally, you may leave the Master Power Switch in the ON position, even when the receiver is not being used. See Figure 55.

Figure 55 – Power Switches

There are several ways in which the AVR 147 may be turned on:

a) Press the Standby/On Switch on the front panel. See Figure 55.

b) Press the Source Select Button on the front panel. See Figure 56.

Figure 56 – Source Select Button

c) Using the remote, press any one of these buttons: AVR, DVD/CD, TAPE/The Bridge, HDMI 1/HDMI 2, VID1, VID2, VID3, XM, AM/FM or 6CH. See Figure 57.

Figure 57 – AVR and Input Selectors

NOTE: Any time you press one of the remote's Input Selectors (i.e., DVD/CD, TAPE/The Bridge, HDMI 1/HDMI 2, VID1, VID2 or VID3), the remote will switch modes so that it will only transmit the codes programmed to operate that device. In order to control the receiver, you will need to press the AVR Button to return the remote to AVR mode.

To turn the receiver off, press either the Standby/On Switch on the front panel, or press the AVR Button and the OFF Button on the remote. Unless the receiver will not be used for an extended period of time (for example, if you will be on vacation), it is not necessary to turn off the Master Power Switch. When the Master Power Switch is turned off, any settings you have programmed, including system configuration and preset radio stations, will be preserved for up to four weeks.

Sleep Timer

You may program the AVR to play for up to 90 minutes and then turn off automatically using the sleep timer.

Press the Sleep Button on the remote, and the time until turn-off will be displayed. See Figure 58. Each additional press of the Sleep Button will reduce the time until turn-off by 10 minutes, until the OFF setting is reached, which disables the sleep timer.

Figure 58 – Sleep Button

When the sleep timer has been set, the front-panel display will automatically dim to half-brightness. If you press any button on the remote or front panel, the display will return to full-brightness. The display will dim again several seconds after your last command.

If you press the Sleep Button after the timer has been set, the remaining time until turn-off will be displayed. You may press the Sleep Button to change the time until turn-off. Pressing and holding the Sleep Button will disable the sleep timer, and the SLEEP OFF message will appear.

Volume Control

The volume may be adjusted either by turning the knob on the front panel (clockwise to increase volume or counterclockwise to decrease volume), or by pressing the Volume Control Buttons on the remote. See Figure 59. The volume is displayed as a negative number of decibels (dB) below the 0dB reference point, and may be changed in 0.5dB increments.

Unlike the volume controls on some other products, 0dB is the maximum volume for the AVR 147. Although it's physically possible to turn the volume to a higher level, doing so may damage your hearing and your speakers. For certain more dynamic audio materials, even 0dB may be too high, allowing for damage to equipment.

Figure 59 – Volume Controls

The AVR 147 is designed to reproduce audio with a minimum amount of distortion, which may lead you to think that your hearing and the equipment can handle higher volumes. We urge caution with regard to volume levels.

Mute Function

To temporarily mute all speakers and the headphones, press the Mute Button on the remote. See Figure 60. Any recording in progress will not be affected. The MUTE message will flash in the display as a reminder. To restore normal audio, either press the Mute Button again, or adjust the volume. Turning off the AVR will also end muting.

Figure 60 – Mute Button

Tone Controls

You may boost or cut either the treble or the bass frequencies by up to 10dB.

Using the front-panel controls or the remote, press the Tone Mode Button once. See Figure 61. This will indicate whether the tone controls are in or out of the circuitry. If you wish to return the tone controls to 0, or "flat" response, press the ◀/▶ Buttons (▲/▼ on the remote) until the TONE OUT message appears, which preserves any changes you have made to the bass or treble settings for later use. To reactivate your changes, the tone control must again be set to TONE IN.

With the TONE IN message displayed, press the Tone Mode Button repeatedly to access TREBLE MODE and BASS MODE. Use the ◀/▶ Buttons (▲/▼ on the remote) to change the treble or bass settings, as desired. The display will return to normal a few seconds after your last command.

Figure 61 – Tone Button

You may alternatively adjust the tone controls using the full-OSD menu system. Press the OSD Button on the remote to view the Master Menu. The cursor will be pointing to the INPUT SETUP line; press the Set Button to display that menu and view the current tone settings. If you wish to make any changes to the TONE, BASS or TREBLE settings, use the arrow keys on the remote to move the cursor to the line you wish to change. Once you have changed the setting using the ◀/▶ Buttons, simply move the cursor up or down to a different line; it isn't necessary to press the Set Button to enter the new setting. When you have finished, either wait until the display times out and disappears, press the OSD Button to clear the display, or move the cursor to the BACK TO MASTER MENU line if you wish to make other changes using the menu system.

NOTE: The AVR 147 does not have a conventional balance control. The EzSet/EQ process compensates for any characteristics of your room or speakers, and we recommend that you leave the settings as they are after EzSet/EQ has been run. However, you may manually adjust the levels of the left and right channels – decreasing one and increasing the other by the same amount – using the Channel Adjust submenu, as described on page 49. This achieves the same effect as a balance control.

Headphones

Plug the 1/4" plug on a pair of headphones into the headphone jack on the front of the receiver for private listening. See Figure 62. The first time you use the headphones, the DOLBY H:BP message will be displayed, indicating that Dolby Headphone surround processing is in the bypass mode, which delivers a conventional 2-channel signal to the headphones.

Figure 62 – Headphone Jack

Press the Surround Select Button on the front panel, or the Dolby Button on the remote, to switch to Dolby Headphone virtual surround processing, indicated by the DOLBY H:DH message. Dolby Headphone delivers an enhanced sound field that emulates a 5.1-channel speaker system. No other surround modes are available for the headphones.

Source Selection

Press the front-panel Source Select Button to scroll through the sources. The left side of the button scrolls down the list that appears in the display; the right side scrolls upward. For direct access to the tuner, press the Tuner Band Button, which switches to the last-used band and frequency. See Figure 63. For direct access to any source, press its Input Selector on the remote (see Figure 57).

Figure 63 – Source Select and Tuner Band Buttons

NOTE: The Bridge/DMP source has no icon in the Source Indicators display. When selected, the DMP indication will appear in the message display's upper line, and one of two messages will scroll on the right side to indicate whether The Bridge is unplugged or connected. If you have retitled this source, then only the new name will appear in the upper line.

For direct access to any source, press its Input Selector on the remote (see Figure 57). Since the AVR 147 allows for more source input devices than the remote has buttons for, some sources are required to share buttons. These are the DVD and CD sources, the Tape and The Bridge sources, and the HDMI 1 and HDMI 2 sources. The first press of any of these three Input Selectors will select the source whose name appears on the button (i.e., DVD, Tape or HDMI 1), as indicated by the

button lighting up in red. Press that Input Selector again quickly to select the source whose name appears above the button (i.e., CD, The Bridge or HDMI 2), and the selector will light in green to indicate that you have selected the source whose name is printed above the button.

The AVR 147 will switch to the audio and video inputs assigned to the source. If you set the BASS MGR setting in the Speaker X-over menu to INDEPENDENT, the AVR 147 will change the speaker size configuration to the one you programmed for the source. If you selected a surround mode for the source, the AVR 147 will switch to that mode.

The source name will appear in the upper line of the front-panel display. If you retitled the source, only the new title will appear. Otherwise, the audio input assigned to the source (analog or one of the digital audio inputs) will also appear. The surround mode will be displayed on the lower line. The same information will also appear on screen in the semi-OSD, unless you have set the semi-OSD to OFF in the System Setup menu, as described in the Advanced Functions section.

Audio Input Selection

The AVR 147 is programmed at the factory to use the analog audio inputs for each source (except for the DVD, Video 2, HDMI 1 and HDMI 2 sources; see Table 4). To assign a digital audio input to a source (if you have not done so using the Input Setup menu during Initial Setup), press the Digital Button on the remote or front panel. The current audio input selection will flash in the display, and you may press the ▲/▼ (or ◀/▶ on the front panel) Buttons to scroll through the audio inputs. When the desired input appears, press the Set Button to select it. See Figure 64.

Figure 64 – Digital Input Selection

If the Auto Poll feature is ON in the Input Setup menu, and if a digital audio input has been assigned to the source, the AVR 147 will first check the digital audio input for a signal. If a signal is present, the AVR 147 will select the digital audio input. If no signal is present, the AVR 147 will switch to the analog audio inputs for the source.

Video Input Selection

When a source is selected, the AVR 147 switches to a video input as follows:

Only signals originating at one of the two HDMI inputs will be available at the HDMI output. The AVR 147 will not transcode or convert any other types of video signals to the HDMI format. In addition, the AVR 147 cannot access the video data in the HDMI stream. The on-screen displays are not available via the HDMI output. To view the AVR's displays, connect the Composite or S-video Monitor Output to the corresponding input on your TV, and follow the manufacturer's instructions for selecting the correct video input on your TV.

The COMPONENT IN line of the Input Setup menu indicates which of the two component video inputs on the AVR 147 is assigned to each source. All of the sources listed in the left column of the Source Indicators display on the front panel are assigned to the Component Video 2 inputs by default, and the sources listed in the right column default to the Component Video 1 sources. See Figure 65.

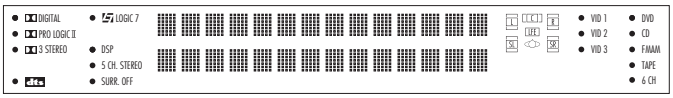


Figure 65 – Front-Panel Input Indicators

You may reassign either component video input to another source if it is physically connected to that input, but there is no option to disable the component video inputs for any source. If a signal is present at the component video input assigned to that source, it will be selected. If your device is not using component video, make sure that other devices connected to the component video inputs are turned off.

If no signal is present at the component video input, then the S-video or composite video input for the source will be selected. It is not possible to reassign the S-video or composite video inputs to other sources.

For audio-only sources, such as the tuner or CD inputs, when no component video signal is present, the last-used video source will be selected.

6-Channel Direct Inputs

If you wish to hear audio through the 6-Channel Direct Inputs together with video, then connect your multichannel player to both the 6-Channel Inputs and the Component Video 1 Inputs (the default for the 6-Channel Inputs), and the correct audio and video inputs will be selected when you select 6CH as your source. If your multichannel player uses S-video or composite video connections, first select the source you connected the video output to (e.g., DVD), and then select the 6CH source. See Figure 66.

Figure 66 – 6-Channel Input Selector

Example 1: You would like to connect a DVD-Audio player to the AVR 147. You plan on playing a variety of discs using this player, including conventional DVDs and even CDs as well as multichannel discs. When playing DVDs and CDs, it is preferable to use a digital audio connection to obtain the best sound quality and the benefit of any digital surround formats contained on the DVD. However, when playing DVD-Audio discs, you will need to use the 6-channel analog audio connections. In addition, some of these discs contain video materials. The player does not have an HDMI output.

We recommend that you connect this player as follows:

a) Connect the player's coaxial digital audio output to the Coaxial 1 input on the AVR. This input is assigned by default to the DVD source.

b) Connect the player's component video outputs to the Component Video 1 inputs on the AVR, which are assigned by default to the DVD source. If your video display doesn't have component video inputs,

then connect the player's composite or S-video output to the AVR's corresponding DVD video input.

c) Connect the player's 6-channel analog audio outputs to the AVR's 6-Channel Inputs and assign the Component Video 1 inputs to this source using the Input Setup menu, as described in the Initial Setup section.

d) Program the player's remote control codes into the DVD Input Selector. Note that not all commands will necessarily be available.

When you wish to view a DVD, simply select the DVD source.

When you wish to listen to a DVD-Audio disc and view the menus and other still images on the disc, first select DVD, and then the 6-Channel Inputs as the source.

Example 2: In this example, your multichannel disc player is equipped with an HDMI output. Connect it as follows:

a) Connect the player's coaxial digital audio output to the Coaxial 2 input on the AVR. This input is assigned by default to the HDMI 1 source.

b) Connect the player's HDMI output to the HDMI 1 source input, and make sure to connect the AVR's HDMI Output to your video display.

c) Connect the player's 6-channel analog audio outputs to the AVR's 6-Channel Inputs and then select an unused component video input at the COMPONENT IN line to avoid inadvertently selecting the video signal from another device.

d) Program the player's remote control codes into the HDMI 1 Input Selector.

When you wish to view a DVD, simply select the HDMI 1 source.

When you wish to play a multichannel disc, first select the HDMI 1 source to obtain the correct video signal, then select the 6-Channel Inputs to select the audio signal.

To select the 6-Channel Inputs as the source, use either the Source Selector on the front panel or press the 6CH Input Selector on the remote. See Figure 67.

Figure 67 – 6-Channel Input Selector

NOTE: The 6-Channel Inputs pass the incoming signals directly to the volume control, without digitizing or processing them. Therefore, you will need to configure bass management settings (i.e., speaker size, delay and output level) on your source device so that they match the settings you programmed using EzSet/EQ, which may be viewed using the Manual Setup menu (see the Advanced Functions section). Consult the owner's guide for your multichannel player for more information.

Using the Tuner

The AVR 147's built-in tuner may be selected in one of three ways (see Figure 68):

1. Press the Source Selector Button on the front panel repeatedly until the tuner is selected. The last-used band (AM or FM) will be active.
2. Press the Tuner Band Button (marked AM/FM). Press this button again to switch bands. This will also enable you to select XM Radio, which is described separately in the next section.
3. Press the Tuner Input Selector (marked AM/FM) on the remote. Press this button again to switch bands (AM, FM or XM).

Figure 68 – Tuner Input Selection

Radio stations may be selected in one of four ways (see Figure 69):

1. If you know the frequency number, enter it directly by first pressing the Direct Button on the remote, and then using the Numeric Keys.
2. After you have programmed Preset stations (see below), enter either the Preset number (1 through 30) using the remote, or use the Preset Stations Button (front-panel or remote) to scroll through the list of presets.
3. In Auto tuning mode, with each press of the Tuning Buttons (front-panel or remote) the AVR 147 will scan in the chosen direction until a station with acceptable signal strength is detected. Press the Tuning Button again to stop scanning.
4. In Manual tuning mode, with each press of the Tuning Buttons the AVR 147 will tune the next frequency increment (0.1MHz for FM, or 10kHz for AM) in the selected direction. Press and hold the Tuning Button for faster scanning.

Figure 69 – Tuning a Station

Press the Tuning Mode Button (TUN-M on the remote) to switch between Auto and Manual tuning modes. See Figure 70. When an FM station has been tuned, pressing the Tuning Mode Button will switch between stereo and mono tuning, which may improve reception of weaker stations.

Figure 70 – Tuning Mode

To store a station in one of the 30 presets (see Figure 71):

1. Tune the desired station.
2. Press the Memory Button on the remote.
3. Use the Numeric Keys to enter the desired preset number.

Figure 71 – Storing a Preset Station

XM Radio Operation

XM Radio is a satellite-delivered service that offers hundreds of program channels, as well as local traffic and weather information for select cities. The AVR 147 is "XM Ready," which means that it is able to receive the XM service when an optional XM antenna module is connected and the service activated. As of this writing, the Audiovox® CNP 1000 "Connect and Play" module for home audio use and the XM Mini-Tuner and Home Dock (Models CNP-2000 and CNP-2000H) are compatible with the AVR 147. Additional modules may become available in the future. Modules produced for automotive, or "mobile," use are not compatible with the AVR 147.

NOTE: To listen to XM Radio using the AVR 147, you will need to purchase an XM antenna module and subscription, and you will need to activate your module. (Note that XM service is not available in Alaska or Hawaii.) Visit the XM Radio Web site at www.xmradio.com for more information.

Plug the module into the XM Antenna Jack on the rear of the AVR 147. Place the antenna module so that it has a clear "view" through a south-facing window in order to obtain reception from the XM satellite.

Select XM Radio as the source in one of the following three ways (see Figure 72):

1. Press the Source Select Button on the front panel repeatedly until XM Radio is selected. XM will only appear in the Message Display.
2. Press the Tuner Band Button (front-panel or remote) repeatedly until XM Radio is selected.
3. Press the XM Radio Input Selector on the remote.

Figure 72 – XM Radio Source Selection

You should be able to tune in Channel 1, the Preview Channel, to confirm that your equipment is ready for activation. There are three ways to tune an XM Radio channel (see Figure 69):

1. Enter the channel number directly using the Numeric Keys on the remote. It is not necessary to press the Direct Button first.
2. Press the Tuning Buttons on the front panel or remote to scan through the channels. Auto tuning mode is not available.
3. The AVR 147 is capable of storing up to 40 XM Radio preset channels. The presets are divided into five banks, denoted by the letters A through E, with eight numeric presets per bank. After you have programmed preset stations (see below), you may select one by pressing the Set Button repeatedly until PRESET SEARCH appears, then use the ▲/▼ Buttons to change the bank (A through E). Use the Preset Buttons to scan through the eight numeric positions within a bank.

When you are able to hear Channel 1, you are ready to activate your module. If you don't hear Channel 1, make sure the module's plug is firmly seated in the XM Antenna jack, and that the module is near a south-facing window. Try unfolding the module and rotating it to obtain reception. You may need to purchase an extension cable, available on the XM Radio site, to ensure that the module is near the window.

Tune to Channel 0 for a display of your antenna module's Radio ID number, required for activation.

The current channel number and preset location will appear in the upper line of the Message Display, and the channel's name will appear in the lower line. Three signal-strength bars will appear to the right of the channel number and preset location. If you wish to display the category, current artist or song title, press the Tuning Mode Button repeatedly.

For traffic and weather channels, the current city's name will appear instead of the channel name, and pressing the Tuning Mode Button repeatedly will display the local weather and temperature.

Press the Set Button to search all channels. Press it again to search by category, using the ▲/▼ Buttons to change the category. Press the Set Button again to tune the lowest-numbered station available in that category, or without using the arrow keys, press the Set Button to change the preset bank, using the ▲/▼ Buttons to change the bank letter. Press the Set Button again to return to the all-channel search.

To store the current channel in one of the 40 preset locations:

1. Press the Set Button repeatedly until PRESET SEARCH appears, then use the ▲/▼ Buttons until the desired bank of presets (A through E) appears in the upper line of the message display.
2. Press the Memory Button, and a line will appear next to the preset bank letter.
3. Use the Numeric Keys to enter the preset location (1 through 8) you wish to store the channel in.

Recording

Two-channel analog and digital audio signals, as well as composite and S-video signals, are normally available at the appropriate recording outputs. Thus, to make a recording, you need only make sure to connect your audio or video recorder to the appropriate output jacks (as described in the Installation section), insert blank media and make sure the recorder is turned on and recording while the source is playing.

NOTES:

1. Analog audio signals are not converted to digital form, and digital audio signals are not converted to analog audio form. However, you may record a coaxial or optical digital audio source using either type of digital audio output.
2. Only PCM digital audio signals are available for recording. Proprietary formats such as Dolby Digital and DTS may not be recorded using the digital audio connections, although if the source is connected to the AVR using the analog audio connections, an analog recording may be made.
3. HDMI and Component video sources are not available for recording.
4. Please make certain that you are aware of any copyright restrictions on any material you record. Unauthorized duplication of copyrighted materials is prohibited by federal law.

Using The Bridge™

The Bridge is an optional dock that may be used with a compatible iPod (not included). When The Bridge is connected to its proprietary input on the AVR 147 and the iPod is docked, you may enjoy the audio, video and still-image materials on your iPod through your high-quality audio/video system, operate the iPod using the AVR remote or the AVR's front-panel controls, view navigation messages on the AVR's front panel or a connected video display, and charge the iPod.

Either press the front-panel Source Selector repeatedly until the message "DMP/The Bridge is CONNECTED" scrolls across the front-panel and semi-OSD displays, or press the DMP Button on the remote to select The Bridge as the input source.

(Left) Figure 73 – Using The Bridge (Remote)

(Above) Figure 74 – Using The Bridge (Front Panel)

Table 5 summarizes the controls available when The Bridge is in use; see also Figures 73 and 74.

Table 5 – Using The Bridge

iPod Function	Remote Control Key	Front-Panel Button
Play	Play (▶)	Tuner Mode
Pause	Pause (II)	Tuner Mode
Menu	Menu (Spkr)	Tuner Band (AM/FM)
Select	Set	Set
Scroll Forward	Left Arrow (◀)	Preset Down
Scroll Reverse	Right Arrow (▶)	Preset Up
Forward Search/Next Track	Forward/Next (▶▶)	Tuning Up
Reverse Search/Previous Track	Reverse/Previous (◀◀)	Tuning Down

NOTE: For the Search function, press and hold the indicated button. Pressing the Previous Track Button once skips to the beginning of the current track. Press the Previous Track Button *twice* to skip to the beginning of the previous track.

It is possible to activate Repeat (one track or one album/playlist) and Shuffle (songs or albums) modes using the DMP SETTING menu (see Figure 54). This menu may also be used to turn on the Resume feature, which resumes play of the current track from the point it was interrupted, or to enable charging while the AVR is in Standby mode.

NOTE: The Resume setting disables the Remember Playback Position setting that you may set for audio and video files using later versions of iTunes. Resume affects all files on the iPod until you manually change the setting either in the DMP SETTING menu or using iTunes.

Access the DMP SETTING menu by pressing OSD to display the MASTER MENU. Press the Set Button to display the INPUT SETUP menu. When DMP/The Bridge is selected as the current source, you may scroll down to the GO TO DMP SETTING line and press the Set Button to display the DMP SETTING menu. See the Initial Setup section for more information on using the DMP SETTING menu.

NOTES ON VIDEO PLAYBACK:

- Before attempting to play videos stored on your iPod, check the Video Settings menu on the iPod and make sure that the TV Out setting is set to On. The TV Signal setting should be NTSC to match the capabilities of your video display. Set Widescreen to On or Off, depending on the aspect ratio of your video display. If your selection was playing and paused at the time you changed the TV Out setting, the iPod may require you to navigate its menu system and reselect the video for the new TV Out setting to take effect. Resuming play from the Now Playing function may not reflect the change to the TV Out setting. This is a function of the iPod, not the AVR 147.
- In Video mode, the iPod's menus will not be visible on your video display, although you may view them on the iPod's screen. You may operate the iPod using the AVR remote, as long as it is in The Bridge device mode.
- You may view the AVR's on-screen displays while The Bridge is in use, just as you would with any other video source.
- The MP4 and H.264 video formats often used for videos to be played on the iPod are intended for optimal performance on the iPod's small screen. Playback on larger displays may have different results.

Selecting a Surround Mode

Surround mode selection can be as simple or sophisticated as your individual system and tastes. Feel free to experiment with the many available surround modes on the AVR 147, and you may find a few that become your favorites for certain sources or program types. Although more detailed information on surround modes may be found in the Advanced Functions section, it is easy to select any of the modes available at a given time:

To select a surround mode using the front-panel controls, press the Surround Mode Button repeatedly until the desired group of modes is selected: Logic 7, Dolby, DTS, DSP or Stereo. Then press the Surround Select Button repeatedly to select the desired mode within the group. See Figure 75.

Figure 75 – Select a Surround Mode (Front Panel)

To select a surround mode using the remote control, locate the button dedicated to the desired group of modes: Logic 7, Dolby Sur, DTS Sur, DTS Neo:6, Surr (DSP) or Stereo. Press that button repeatedly to select the desired mode. See Figure 76.

Figure 76 – Select a Surround Mode (Remote)

To select a surround mode using the full-OSD menu system, press the OSD Button to display the Master Menu. Navigate to the SURROUND SELECT line and press the Set Button to view the Surround Select menu (see Figure 78). Each of the major surround mode groups is listed here. Select a group to access the MODE setting for selection of an individual mode. As explained in the Advanced Functions section, there are also some additional settings that may be made.

You are now ready to enjoy the best in home theater entertainment with your AVR 147. As you become more familiar with the receiver, you may wish to explore some of its advanced functions, which are described in the following section.

ADVANCED FUNCTIONS

Much of the AVR 147's performance is handled automatically, with little intervention required on your part. However, the AVR 147 is a sophisticated component, and is capable of being customized to suit your particular system and your tastes. In this section we describe some of the more advanced adjustments available on the AVR 147. You may save this section for later, when you have become more familiar with your receiver.

Audio Processing and Surround Sound

Audio signals generated by sources are encoded in a variety of formats that can affect not only the quality of the sound but the number of speaker channels and the surround mode. You may also manually select a different surround mode, although for certain types of audio signals, the modes available will be limited in certain ways, as described below.

Analog Audio Signals

Analog audio signals usually consist of two channels – left and right. The AVR 147 offers three basic options for playback of analog audio:

1. **Analog Bypass Mode:** In this mode, the 2-channel signal is passed directly to the volume control, without being digitized or undergoing any processing for bass management or surround sound. The requirements for selecting analog bypass mode are:

   a) The analog audio inputs for the source must be selected. If necessary, press the Digital Button on the remote and use the ▲/▼ Buttons to make the selection.

   b) The tone controls must be disabled by setting TONE MODE to OUT. Either use the Input Setup menu in the full-OSD system to make this change, or press the Tone Mode Button on the front panel or remote and use the ◀/▶ Buttons (▲/▼ on the remote) until the TONE OUT message appears.

   c) The Surround Off mode must be selected. The easiest way to select the Surround Off mode is to press the Stereo Button on the remote until the Surround Off icon is lit (and the DSP icon is *not* lit) in the front-panel display.

2. **DSP Surround Off Mode:** The DSP Surround Off mode digitizes the incoming signal and applies the bass management settings, including speaker configuration, delay times and output levels. This mode is desirable when your front speakers are small, limited-range satellites and you are using a subwoofer. Both the DSP and Surround Off icons will be lit when this mode is active. Press the Stereo Button on the remote repeatedly to select this mode.

3. **Analog Surround Modes:** One of the main benefits of a surround receiver such as the AVR 147 is its ability to process 2-channel audio signals to produce multichannel surround sound in a variety of modes, even when no surround sound has been encoded in the recording. Among the available modes are the Dolby Pro Logic II modes, the Dolby Virtual Speaker modes, the DTS Neo:6 modes, the Logic 7 modes, the Hall and Theater modes and the Stereo modes.

Digital Audio Signals

Digital audio signals offer the benefit of greater capacity, which allows recording artists to encode center and surround channel information directly into the signal. The result is improved sound quality and startling directionality, since each of these channels is reproduced discretely.

Alternatively, the artist may encode only two channels, but the digital signal allows for a higher sampling rate that delivers greater detail. High-resolution recordings usually sound extraordinarily distortion-free at all frequencies, but especially at high frequencies.

Multichannel digital recordings usually are found in the 5.1-, 6.1- or 7.1-channel formats. The channels included in a 5.1-channel recording are front left, front right, center, surround left, surround right and LFE. The LFE channel is denoted as ".1" to represent the fact that it is not full-range, being limited to the low frequencies.

6.1-Channel recordings add a single surround back channel, and 7.1-channel recordings add surround back left and surround back right channels to the 5.1-channel configuration. The AVR 147 is unable to play the surround back channels in these recordings, and will use 5.1-channel (or fewer) surround modes.

Digital formats include Dolby Digital 2.0 (two channels only), Dolby Digital 5.1, DTS 5.1, DTS 96/24 and 2-channel PCM modes in 32kHz, 44.1kHz, 48kHz or 96kHz.

When a digital signal is received, the AVR 147 detects the encoding method and the number of channels. The appropriate icon will light in the front panel for Dolby Digital and DTS signals. The number of channels encoded will scroll once across the front panel display as three numbers, separated by slashes (e.g., "3/2/.1").

The first number indicates the number of front channels in the signal:

"1" represents a monophonic recording, usually an older program that has been digitally remastered or, more rarely, a modern program for which the director has chosen a special effect.

"2" indicates the presence of the left and right channels, but no center channel.

"3" indicates that all three front channels (left, right and center) are present.

The second number indicates whether any surround channels are present:

"0" indicates that no surround information is present.

"1" indicates that a matrixed surround signal is present.

"2" indicates discrete left and right surround channels.

The third number is used for the LFE channel:

"0" indicates no LFE channel.

".1" indicates that an LFE channel is present.

NOTE: The 6.1-channel signals – Dolby Digital EX and DTS-ES Matrix and Discrete – each include a flag meant to signal the receiver to decode the surround back channel. Since the AVR 147 is only capable of processing and playing 5.1 channels, the indications EX-OFF or ES-OFF, as appropriate, will always appear for 6.1-channel bitstreams.

Refer to Table 6 for more information on which surround modes are available with different bitstreams.

When a PCM signal is received, the PCM message, followed by the sampling rate of the signal (32kHz, 44.1kHz, 48kHz or 96kHz), will scroll once across the front-panel display.

In addition, the Speaker/Channel Input Indicators will indicate the number of channels discretely encoded in the signal by displaying a letter inside that channel's speaker box. The letters flash when no signal is present, such as when a DVD is paused. See Figure 77.

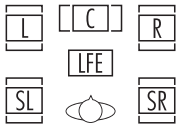


Figure 77 – Speaker/Channel Input Indicators

Even when only two channels – left and right – are present in the signal, the analog surround modes may be used to decode the signal into the remaining channels.

NOTE: Dolby Digital 2.0 signals may also include a Dolby Surround flag indicating DS-ON or DS-OFF, depending on whether the two-channel bitstream contains only stereo information, or a downmix of a multichannel program that can be decoded by the Dolby Pro Logic decoder in the AVR. By default, these signals are played in Dolby Pro Logic II Movie mode, but you may select another Dolby surround mode manually.

Surround Modes

As mentioned in the Introduction to Home Theater section, surround mode selection is dependent upon the format of the incoming audio signal, as well as personal taste. There is no harm in experimenting with all of the modes available with any given source material. Table 6 offers a brief description of each mode the AVR 147 is capable of using, and also indicates the types of incoming signals or digital bitstreams the mode may be used with. Additional information about the Dolby and DTS modes is available on the companies' Web sites: www.dolby.com and www.dtsonline.com.

When in doubt, check the jacket of your DVD for more information on which surround modes are available on the disc. Usually nonessential sections of the disc, such as trailers, extra materials or the disc menu, are only available in Dolby Digital 2.0 (2-channel) or PCM 2-channel mode. If the main title is playing and the letters in the Speaker/Channel Input Indicators are not lit for all speaker locations, look for an audio setup section in the disc's menu. Also, make sure your DVD player's audio output is set to the original bitstream rather than just PCM. Check the DVD player's output setting by stopping play of the disc and checking the DVD player's menu system.

As indicated in Table 6, different surround modes may only be available with certain input signals or bitstream formats. For any incoming signal, only a limited number of surround modes are available. Although there is never a time when all of the AVR 147's surround modes are available, there is usually a wide variety of modes available for a given input.

There are three methods of manually selecting one of the available surround modes:

1. From the front panel, press the Surround Mode Button until the desired mode group (Dolby, DTS, DSP, Stereo, Logic 7) is selected, and the last-used mode from that group will be activated. Then press the Surround Select Button repeatedly to scroll through the modes available within that group.

2. Using the remote, press the button for the desired mode group:

   Dolby Sur for the Dolby modes
   DTS Sur for the DTS Digital modes
   DTS Neo:6 for the DTS Neo:6 modes
   Logic 7 for the Logic 7 modes
   Stereo for the Stereo or Surround Off modes
   Surr for the DSP Surround modes (Hall 1, Hall 2, Theater)

   Press the mode button repeatedly to scroll through the modes available within that group.

3. The full-OSD menu system allows access to submenus for each of the mode groups through the Surround Select menu. See Figure 78.

Figure 78 – Surround Select Menu Screen

Navigate to the line for the desired surround mode group, and press the Set Button to access the submenu for that group. In most cases, the submenu consists of only two lines:

1. **MODE:** Displays the currently selected mode. Use the ◀/▶ Buttons to scroll through the available modes.

2. **BACK TO SURROUND SELECT:** May be used to exit the submenu.

The Dolby Surround submenu adds some advanced settings.

Dolby Surround Settings

In addition to the MODE line, the DOLBY SURROUND submenu includes three settings that are active only when the Dolby Pro Logic II Music mode has been selected. See Figure 79.

Figure 79 – Dolby Surround Menu Screen

CENTER WIDTH: This setting affects how vocals sound through the three front speakers. A higher number (up to 7) focuses the vocal information tightly on the center channel. Lower numbers broaden the vocal soundstage across the three speakers.

DIMENSION: This setting affects the depth of the surround presentation, allowing you to "move" the sound toward the front or rear of the room. The setting of "0" is a neutral default. Setting "F-3" moves the sound mostly toward the front of the room, while setting "R-3" moves the sound mostly toward the rear.

PANORAMA: With the Panorama mode turned ON, some of the sound from the front speakers is moved to the surround speakers, creating an enveloping "wraparound" type of effect.

NIGHT MODE: Night mode is available with some Dolby Digital programs, if it has been encoded in the material. It compresses the peak sound levels, maintaining the intelligibility of the dialogue and quieter passages, while reducing the loudness of special effects and louder passages to avoid disturbing others. Three levels of compression are available:

OFF: At this setting, there is no compression, as the Night mode is deactivated.

MID: A mild compression is applied.

MAX: More compression is applied.

We suggest that you experiment with the modes to find a setting that meets your needs.

The Night mode may also be adjusted without using the full-OSD menu system. With a Dolby Digital program encoded with Night mode playing, press the Night Button on the remote. Each press of the button will cycle through the three settings, with the selected setting being displayed on the front panel and in the semi-OSD display.

UPSAMPLING: The last line of the Surround Select menu activates upsampling, only available with the Dolby Pro Logic II Movie, Dolby Pro Logic II Music and Dolby Pro Logic modes. Normally set to OFF, upsampling, when activated, processes digital sources at a higher resolution for improved sound quality. This feature can be useful to eliminate distortion in some low-resolution sources.

Default Modes

During initial use or after a processor reset, the AVR 147 will default to the Logic 7 Music mode for all analog and PCM audio inputs. Subsequently, when a source input is selected and an analog or PCM signal is received, the AVR will switch to the last surround mode used for that source input/incoming signal combination.

Whenever a multichannel Dolby Digital or DTS signal is detected, the AVR 147 will automatically switch to that mode, unless the DEFAULT SURR MODE setting in the System Setup menu has been changed to OFF. Table 6 reflects that other surround modes are available for use with the multichannel digital bitstreams. If you would prefer the AVR 147 to use one of those alternate modes any time the same digital signal is detected, then select that mode while the multichannel bitstream is present, and then change the DEFAULT SURR MODE setting in the System Setup menu to OFF.

Table 6 provides descriptions of all surround modes available on the AVR 147, along with the incoming bitstreams or signals that the particular mode may be used with. Feel free to experiment and simply cycle through all of the available modes at any time; you cannot cause any problems for the AVR 147 by doing so.

Table 6 – Surround Modes

Surround Mode	Description	Incoming Bitstream or Signal
Dolby Digital	Provides up to five separate main audio channels and a dedicated low-frequency effects (LFE) channel. May be encoded for Night mode, which allows the user to apply a compression setting that maintains intelligibility of softer passages while reducing the loudness of dynamic passages to avoid disturbing others.	• Dolby Digital 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 2/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • Dolby Digital EX (played as 5.1)
Dolby Digital Stereo	Delivers a 2-channel downmix of Dolby Digital materials.	• Dolby Digital 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 2/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • Dolby Digital EX

Table 6 – Surround Modes

Surround Mode	Description	Incoming Bitstream or Signal
Dolby Pro Logic II	Analog decoder that derives five full-range, discrete main audio channels from matrix surround-encoded or 2-channel analog sources. Four variants are available.	See below.
Dolby Pro Logic II Movie	Variant of Dolby Pro Logic II that is optimized for movie and television programs.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic II Music	Variant of Dolby Pro Logic II that is optimized for music selections. Allows adjustment of sound field presentation in three dimensions: • Center Width (adjusts width of vocal soundstage) • Dimension (adjusts depth of soundstage) • Panorama (adjusts wraparound surround effect)	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic II Game	Variant of Dolby Pro Logic II that emphasizes use of the surround channels and subwoofer for total immersion in the video gaming experience.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Pro Logic	Original version of Dolby Pro Logic that steered a mono signal containing information below 7kHz to the surround channels.	• Dolby Digital 2.0 or 2.1 • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Dolby Virtual Speaker	Simulates 5.1 channels when fewer speakers are present, or a more enveloping sound field is desired.	See below.
Dolby Virtual Speaker Reference	When fewer than five main speakers are present, the Reference mode virtualizes the missing speakers with accurate localization. Select from two- or three-speaker mode, depending on how many physical speakers are in your system.	• Dolby Digital (uses only two-speaker mode when signal does not contain center channel information) • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
Dolby Virtual Speaker Wide	Wide mode may be used with two, three, four or five main speakers to widen the front soundstage by virtualizing the locations of the left and right speakers.	• Dolby Digital (number of channels available varies by number of channels in signal) • Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
DTS Digital Surround	Using a different encoding/decoding method than Dolby Digital, it also provides up to five discrete main channels, plus an LFE channel.	• DTS 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 3/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • DTS-ES Matrix (played as 5.1) • DTS-ES Discrete (played as 5.1)
DTS Stereo	Delivers a 2-channel downmix of DTS Digital materials, or presents a matrix-encoded surround presentation.	• DTS 1/0/.0 or .1, 2/0/.0 or .1, 3/0/.0 or .1, 3/1/.0 or .1, 2/2/.0 or .1, 3/2/.0 or .1 • DTS 96/24 • DTS-ES Matrix • DTS-ES Discrete
DTS Neo:6	DTS Neo:6 analog processing is available with DTS-ES (Matrix or Discrete) signals and 2-channel analog or PCM signals to create a 3- or 5-channel presentation.	See below.

Table 6 – Surround Modes (Continued)

Surround Mode	Description	Incoming Bitstream or Signal
DTS Neo:6 Cinema	Depending on the number of speakers in your system, select 3- or 5-channel modes, enhanced for movie or video presentations.	• DTS-ES Matrix • DTS-ES Discrete • Analog (2-channel) • PCM (32kHz, 44.1kHz or 48kHz)
DTS Neo:6 Music	Available only in 5-channel mode, creates a surround presentation suitable for music recordings.	• DTS-ES Matrix • DTS-ES Discrete • Analog (2-channel) • PCM (32kHz, 44.1kHz or 48kHz)
Logic 7	Exclusive to Harman Kardon, Logic 7 enhances 2-channel recordings by deriving separate information for the surround back channels. This provides more accurate placement of sound, improves panning and expands the sound field, even when used with 5.1-channel systems. Logic 7 uses 96kHz processing. Three variants are available.	See below.
Logic 7 Cinema	Especially suited to 2-channel sources containing Dolby Surround or matrix encoding, Logic 7 Cinema mode increases center channel intelligibility.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Logic 7 Music	The AVR 147 is programmed at the factory to default to this mode for 2-channel signals. Logic 7 Music mode is well suited to conventional 2-channel music recordings.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Logic 7 Enhance	Logic 7 Enhance circulates low frequencies in the 40Hz – 120Hz range to the main speakers for less localized bass performance than would be achieved solely with a subwoofer. Enhance mode is best used with music recordings.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Hall 1	Hall 1 is a DSP (digital signal processor) mode that simulates a small concert hall.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
Hall 2	Simulates a medium-sized concert hall.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
Theater	Simulates a live-performance theater.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
5-Channel Stereo	Useful for parties, the left- and right-channel information is played through both the front and surround speakers on each side, while the center speaker plays a summed mono mix.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz or 48kHz)
DSP Surround Off	Turns off all surround processing and plays a pure 2-channel signal. The signal is digitized and bass management settings are applied, making it appropriate when a subwoofer is used.	• Analog (2-channel) • Tuner • PCM (32kHz, 44.1kHz, 48kHz, 96kHz)
Surround Off (Analog Bypass)	Maintains an analog input signal in that form, bypassing all digital processing (i.e., surround and bass management). Requires TONE OUT setting.	• Analog (2-channel) • Tuner

Manual Setup

The AVR 147 is flexibly designed to be used with almost any loudspeakers available. The flexibility arises from the AVR 147's capability to be configured to match the characteristics of your particular speakers, and to compensate for the acoustic characteristics of your room.

EzSet/EQ automatically detects the capabilities of each speaker, and optimizes the AVR 147's performance in your system. However, if for some reason you are unable to run EzSet/EQ, e.g., you have misplaced the microphone, or if you wish to make further adjustments to the settings made by EzSet/EQ, you may use the Manual Setup on-screen menus as described in this section.

Before beginning manual setup you will need to have fully installed your AVR, placed your loudspeakers in their correct locations within the room (see Speaker Placement section on page 19), and connected them to the AVR. You will need the specifications for each of your speakers, which may usually be found in the owner's guide for the speakers or on the manufacturer's Web site. If necessary, contact the manufacturer to obtain the frequency range specification. Although the output-level setting portion of manual setup may be performed "by ear," we recommend that you purchase an SPL (sound-pressure level) meter at a local electronics store.

We suggest that you record your configuration settings in the appropriate places in Tables A3 through A7 in the appendix in case you need to reenter them after a system reset, or if the AVR's Master Power Switch is turned off or the unit is unplugged for more than four weeks.

Step One – Determine Speaker Size

Without using EzSet/EQ, the AVR 147 can't detect how many speakers you've connected to it; nor can it determine their capabilities. For this part of the system setup, you will need to consult the speaker's technical specifications.

The specification you're looking for is the frequency response, which is usually given as a range, e.g., 100Hz – 20kHz (±3dB). This specification tells you whether the speaker is able to play sounds that are very high- or low-pitched, represented by the high and low frequencies. We are concerned with the lowest frequency that each of your main speakers is capable of playing, which is 100Hz in this example. Use the Table A5 worksheet in the appendix to note this number as the crossover for that speaker (not the same as the crossover frequency listed in the speaker's specifications).

Your subwoofer's frequency response will include only the very lowest frequencies, since the subwoofer is designed to play only bass materials. A typical frequency response for a subwoofer is 25Hz – 150Hz. In this case, the higher number is most important and should be noted in the worksheet.

The purpose of entering this information into the AVR 147 is to program the receiver's bass management, which determines which speakers the receiver will use to play back the low-frequency (bass) portion of the source program.

If you send the lowest notes to small satellite speakers, you won't hear these notes very well, and you may even damage the speaker by going beyond its capabilities. If you send the highest notes to the special-purpose subwoofer, you may not hear them at all.

With proper bass management, the AVR 147 divides the source signal at a crossover point. All information above the crossover point is played through the satellite speaker (front left/right, center or surround left/right), and all information below the crossover point is played through the subwoofer. This enables each loudspeaker in your system to perform at its best, delivering an enjoyable sound experience.

Step Two – Measure Speaker Distances

Ideally, all of your speakers were placed in a circle, each at the same distance from the listening position. However, your room may not be ideal, and you may have had to place some speakers a little further away than others. This could affect the overall sound of the receiver, as sounds that are supposed to arrive simultaneously from different speakers blur due to different arrival times.

The AVR 147 has a delay adjustment that enables the receiver to compensate for real-world speaker placements.

Before you begin making adjustments, measure the distance from each speaker to the listening position, and note it in the Table A3 worksheet in the appendix. Even if all of your speakers are the same distance from the listening position, you should enter your speaker distances into the Delay Adjust menu, which is described in Step Three.

Step Three – Manual Setup Menu

Now you are ready to program these adjustments into the receiver. It's best to sit in the usual listening position and make the room as quiet as possible. Don't worry if you make a mistake; you can always go back and change these settings.

With the receiver and video display turned on, press the OSD Button on the remote to display the Master Menu (see Figure 39). Use the ▼ Button on the remote to move the cursor to the MANUAL SETUP line, and press the Set Button to display the Manual Setup menu. See Figure 80.

Figure 80 – Manual Setup Menu Screen

EzSet ACTIVATE: The first line in the Manual Setup menu indicates whether you have run EzSet/EQ and whether the settings obtained by EzSet/EQ have been activated as the starting point for manual setup.

If you have run EzSet/EQ but you wish to start the setup process from scratch, use the ▲/▼ Buttons to move the cursor to this line, and then use the ◀/▶ Buttons to change the setting to NO.

The next four lines of the Manual Setup menu are used to access the four submenus used during the setup process. Each submenu's settings are dependent upon the previous submenu, and therefore we recommend you visit the menus in the order shown.

Speaker Size Menu

Move the cursor to the SPEAKER SIZE line and press the Set Button to display the Speaker Size submenu. See Figure 81.

Figure 81 – Speaker Size Menu Screen

The Speaker Size menu lists each of the speaker groups. You will be programming the correct setting for each group, indicating how many speakers are in your system and what their capabilities are, based on the information you obtained in Step One – Determine Speaker Size. Each of the main speaker groups can be set to one of three settings: LARGE, SMALL or NONE. These settings don't refer to the physical size of the speaker, but rather to its frequency range. These may or may not turn out to be the same.

If the lower number of the frequency response for your speakers is less than 100Hz, choose the LARGE setting. If this number is 100Hz or greater, choose the SMALL setting. If you don't have a speaker installed in to that position, choose NONE. You may record the speaker size setting in Table A5 in the appendix.

As you can see, the system requires you to use both speakers in a pair. For example, you can't connect just a front left speaker without a right speaker, or just a right surround speaker without a left one. However, you can connect only the front speakers, or both front and surround speakers without a center, or the front left/right and center speakers without any surrounds.

LEFT/RIGHT: This line tells the AVR 147 the capabilities of your front left and right speakers. Use the ◀/▶ Buttons to select either SMALL or LARGE for these speakers.

CENTER: Move the cursor to the line for the center speaker, and use the ◀/▶ Buttons to select a setting for this speaker.

NOTE: If the receiver is currently in one of the Logic 7 surround modes, which will be the case the first time you turn on the receiver, you won't be able to set the center speaker to LARGE, due to the requirements of the Logic 7 processor. You may use the SMALL setting instead. As you listen to the receiver, if you find the SMALL setting is not satisfactory, change the surround mode to one of the Dolby Pro Logic II modes (using the Surround Select menu, accessible from the Master Menu), and return to this menu to change the center speaker to the LARGE setting.

SURROUND: Move the cursor to the line for the surround speakers, and use the ◀/▶ Buttons to select the SMALL, LARGE or NONE setting for these two speakers.

SUBWOOFER: Move the cursor to the line for the subwoofer, which is programmed a little differently. The subwoofer's "size" setting depends upon how you programmed the front left and right speakers.

- If you set the front speakers to SMALL, the subwoofer setting will be SUB, and you won't be able to change it. All low-frequency information will always be sent to the subwoofer. If you don't have a subwoofer, you may wish to set your front speakers to LARGE so as not to lose this information, but you may need to lower the volume to avoid adverse results. We recommend that you either upgrade to full-range speakers or add a subwoofer to your system at the earliest opportunity.
- If you set the front speakers to LARGE, you may select from three possible settings for the subwoofer.
  - **L/R+LFE:** This setting sends all low-frequency information to the subwoofer, including both information that would normally be played through the front left and right speakers and the special low-frequency effects (LFE) channel information.
  - **LFE:** This setting plays low-frequency information contained in the left and right program channels to the front speakers, and directs only the LFE channel information to the subwoofer.
  - **NONE:** This setting steers all low-frequency information to the front speakers, and no information to the subwoofer output. Use this setting if you have a passive subwoofer, or a powered subwoofer that you connected to the front speaker outputs.

NOTE: If you are using a Harman Kardon HKTS speaker system, select the SMALL setting for the LEFT/RIGHT, CENTER and SURROUND lines, and the subwoofer will automatically be set to SUB.

BASS MGR: This advanced setting is used if you wish to configure your speakers differently for different sources. For example, you may prefer to set your speakers to LARGE while listening to CDs from your CD player. By changing this setting to INDEPENDENT, you may have different settings for your CD player and your DVD player or other devices. We recommend that you leave this setting at its factory default of GLOBAL until you have more experience with the AVR.

Move the cursor to the BACK TO MANUAL SETUP line and press the Set Button to return to the Manual Setup Menu.

The speaker sizes may also be configured without using the on-screen menu system. Press the Speaker Setup Button on the remote, and use the ▲/▼ Buttons to select the desired speaker group (Front Speakers, Center Speaker, Surround Speakers, Subwoofer). Press the Set Button to display the current setting for the speaker group, and use the ▲/▼ Buttons again to change the setting. Press the Set Button to return to the previous display, or wait a few seconds for the AVR to return to normal operation on its own.

NOTE: The Speaker/Channel Indicators on the front panel of the receiver (see Figure 82) will display the speaker size settings as follows. For each speaker configured as SMALL, a single box will appear in the position for that speaker. For each speaker configured as LARGE, a double box will appear in its position. If a speaker is configured as NONE, no box will appear. The subwoofer will be indicated by a single box, or no box if no subwoofer has been configured. The letters inside the boxes appear when a digital signal is being received that has that channel discretely encoded. The letters flash when the signal is not present, such as when a DVD is paused.

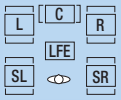


Figure 82 – Speaker/Channel Input Indicators

Speaker Crossover Menu

On the Manual Setup menu, move the cursor to the SPEAKER X-OVER line and press the Set Button to display the Speaker Crossover menu. See Figure 83.

Figure 83 – Speaker Crossover Menu Screen

Setting the Speaker Crossover menu correctly ensures that your speakers are properly used so that they sound their best. Although you could skip this step the first time you use the receiver, we recommend that you take the few extra minutes to enter the correct crossover settings.

You may select from seven possible settings: 40Hz, 60Hz, 80Hz, 100Hz, 120Hz, 150Hz or 200Hz. Depending upon the frequency response of your speakers which you recorded in Step One – Determine Speaker Size, for each speaker group select the number that matches or is just above the low end of your speaker's frequency response. You may record the speaker crossover settings in Table A5 in the appendix.

The LFE line sets the frequency for a low-pass filter that determines what information is sent to the subwoofer for playback. Since the subwoofer output combines low-frequency information for all channels, in order to make sure that no information is lost due to different speakers having different capabilities, the subwoofer filter should be matched to the highest crossover frequency used for any speaker group.

Examine each of your speaker-group settings in this menu, and determine which group is set to the highest frequency. Move the cursor to the LFE line, and use the ◀/▶ Buttons to select that speaker group. If all speaker groups have the same setting, you may leave the LFE filter at its factory default of the LEFT/RIGHT speaker group.

Move the cursor to the BACK TO MANUAL SETUP line and press the Set Button to return to the Manual Setup menu.

It is not possible to adjust the speaker crossover settings without using the on-screen menu system.

Delay Adjust Menu

As explained above in Step Two – Measure Speaker Distances, sometimes the speakers are placed at different distances from the listening position, which can muddy the sound, as sounds are heard earlier or later than desired.

Even if all of your speakers are placed the same distance from the listening position, you should not skip this menu.

On the Manual Setup menu, move the cursor to the DELAY ADJUST line and press the Set Button to display the Delay Adjust menu. See Figure 84.

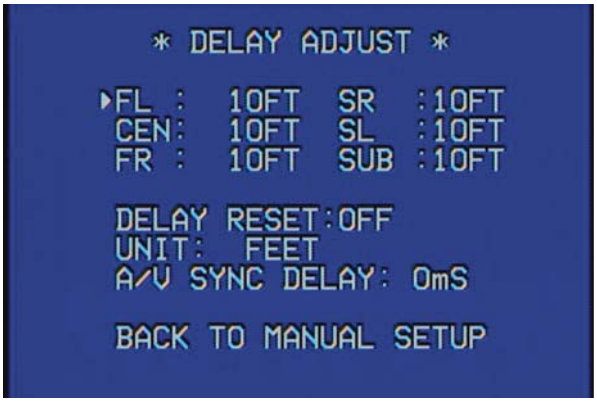


Figure 84 – Delay Adjust Menu Screen

This menu requires you to enter the distance from each speaker to the listening position, which you measured in Step Two – Measure Speaker Distances and noted in Table A3 in the appendix.

The default unit of measurement is in feet. If you wish to change the unit to meters, move the cursor down to the UNIT line, and use the ◀/▶ Buttons to change the unit to METER.

Use the ▲/▼ Buttons to move the cursor to the FL (front left) line; then use the ◀/▶ Buttons to change the measurement as needed. Use the ▲/▼ Buttons to move to each speaker in turn – CEN (center), FR (front right), SR (surround right), SL (surround left) and SUB (subwoofer).

DELAY RESET: This line is used if you wish to reset all of the speaker delay settings to the factory default of 10 feet (3.0 meters) at once. Use the ◀/▶ Buttons to change the setting of OFF to ON. If you change any speaker's setting, this line will automatically revert to OFF.

A/V SYNC DELAY: This line allows you to compensate for a situation in which one of your source devices, or your video display, introduces a significant amount of video processing that causes the audio and video parts of the signal to lose synchronization. This is known as a "lip sync" problem. You may delay the audio for all channels by up to 80 milliseconds to compensate.

NOTE: We recommend that you adjust the A/V Sync Delay using the Delay Button on the remote, rather than in this menu, so that you can view the picture while adjusting the audio delay. With the program playing, press the Delay Button, and the A/V SYNC DELAY message will appear on the front panel and in the semi-OSD display. Press the Set Button to display the current delay setting, and use the ▲/▼ Buttons to adjust the setting until the picture and sound are back in sync.

Move the cursor to the BACK TO MANUAL SETUP line and press the Set Button to return to the Manual Setup menu.

You may adjust the delay settings without using the on-screen menu system. Select a surround mode that uses all of the speakers in your system. Press the Delay Button on the remote to display the A/V SYNC DELAY message. If you wish to adjust A/V Sync Delay as described in the above note, press the Set Button to select it. Otherwise, use the ▲/▼ Buttons to scroll through the list of all loudspeakers in your system. Press the Set Button when the speaker you wish to adjust is displayed, and use the ▲/▼ Buttons again to change the setting. Press the Set Button to return to the previous display, or wait a few seconds for the AVR to return to normal operation on its own.

Step Four – Setting Channel Output Levels Manually

For a conventional 2-channel receiver, the balance control enables the user to control the stereo imaging by adjusting the relative loudness of the left and right channels, as heard at the listening position.

With up to five main channels plus a subwoofer, imaging becomes both more critical and more complex. Unlike the rotary balance control, the goal of the AVR 147's channel output adjustment process is to examine the output level of each channel independently and ensure that each is heard at the listening position with equal loudness.

If you followed the instructions in the Initial Setup section, then you let EzSet/EQ handle this critical task for you, simply and automatically.

However, if you prefer to make these adjustments manually, the AVR 147's Channel Adjust menu allows you to do so, either using the system's test tone or while playing source material. In addition, this is the only method for adjusting the level of the subwoofer.

You may use a handheld SPL meter (available at most electronics stores) set to the C-Weighting, Slow scale.

1. Make sure all speakers have been connected correctly.
2. Adjust the size, crossover and delay for each speaker in your system as described in Step Three.
3. If you are using a handheld SPL meter with source material, such as a test disc or another audio selection, play it now and adjust the AVR's master volume control until the meter measures 75dB.
4. There are several methods of adjusting the channel output levels, using either the test tone or source materials. In all cases, you may measure the channel levels in one of two ways:

   a) By ear. Try to adjust the levels so that all channels sound equally loud.

   b) Using a handheld SPL meter set to the C-Weighting, Slow scale. Try to adjust each channel so that the meter reads 75dB.

The best method of setting the output levels is by running EzSet/EQ, as described in the Initial Setup section. If any finer adjustments are desired, we recommend using the full-OSD system to make the adjustments while playing the AVR's built-in test tone and measuring the output using an SPL meter. Less effective would be to measure the output by ear. The adjustments may also be made using the remote's Test Tone command or Channel command. Although the Channel command is also accessible using the front-panel controls, we don't recommend doing so, as the measurements cannot be made from the listening position.

A. Using the Remote Control With the Test Tone

While sitting in the listening position, press the Test Button on the remote. The test tone will start playing at the front left channel. After a few seconds, it will move to the center channel, then the front right channel, surround right, surround left and finally the subwoofer, displaying the channel name on the front of the receiver and in the semi-OSD display, as well as the current level setting (varies between –10dB and +10dB). Press the ▲/▼ Buttons to adjust the level setting, and the tone will remain at that channel until several seconds after your last adjustment. When you have finished adjusting the levels, press the Test Button again to stop the tone. Measure the levels by ear, using an SPL meter, or using the remote, as described above.

B. Using the Front-Panel or Remote Control Channel Command

You may adjust the levels by pressing the Channel Button on the front panel, and the FRONT L LEVEL message will appear. Use the ◀/▶ Buttons on the front panel to select the desired speaker channel to adjust, and press the Set Button when the desired channel is displayed. The current level for that channel will appear, and you may adjust it using the ◀/▶ Buttons. Press the Set Button to return to the speaker channel choices. This method is not recommended, as you will not be able to measure the channel levels at the listening position. In addition, this method requires a source to be playing.

You may also access the Channel command by pressing the Channel Button on the remote. Use the ▲/▼ Buttons to select the desired speaker channel and press the Set Button, then use the ▲/▼ Buttons again to adjust the level. As with the front-panel controls, a source should be playing for best results. However, the source may be mixed to highlight certain channels at various times during the selection, which could skew the results when a different program is played.

C. Using the Full-OSD Menu

Next to EzSet/EQ, the full-OSD menu system offers the easiest and most flexible manner of setting output levels. Press the OSD Button to display the Master Menu, and then navigate to the MANUAL SETUP line. Press the Set Button to display the Manual Setup menu, and then navigate to the CHANNEL ADJUST line. Press the Set Button to display the Channel Adjust menu. See Figure 85.

* CHANNEL ADJUST *
FL : 0dB SR : 0dB
CEN: 0dB SL : 0dB
FR : 0dB SUB: 0dB
CHANNEL RESET:OFF
TEST TONE SEQ:AUTO
TEST TONE :OFF
BACK TO MANUAL SETUP

Figure 85 – Channel Adjust Menu Screen

All of the speaker channels will appear at the top of the screen with their current level settings. Any channels that have not been programmed using the Speaker Size menu will display four dashes and will not be accessible. If you have selected a surround mode that does not utilize all speakers, such as Surround Off, you will see dashed lines next to the speakers that aren't needed for that mode.

CHANNEL RESET: If you wish to start by resetting all of the levels to their factory defaults of 0dB, navigate to this line and change the setting to ON. The levels will be reset, and this setting will then revert to OFF.

If you are using an external source to set your output levels, simply navigate to each channel and use the ▲/▼ Buttons to adjust the level as desired.

If you would like to set your levels using the AVR 147's internal test tone, adjust the TEST TONE SEQ and TEST TONE lines as follows.

TEST TONE SEQ: When this setting reads AUTO, the test tone will automatically circulate to all channels, pausing for a few moments at each channel and then moving to the next channel several seconds later, as indicated by the blinking cursor. You may adjust the level for any channel when the test tone is paused there by using the ◀/▶ Buttons. You may also use the ▲/▼ Buttons at any time to move the cursor to another line, and the test tone will follow the cursor.

When this setting reads MANUAL, the test tone will not move to the next channel until you use the ▲/▼ Buttons to move it.

TEST TONE: This line determines whether the test tone is active. To begin the process of setting the levels, use the ◀/▶ Buttons to change the setting to ON. Any time you manually move the cursor out of the channel listings area of the screen, this setting will automatically change to OFF, stopping the test tone.

NOTE: Setting the channel levels while one surround mode is active does not necessarily carry over to all other modes. We recommend that after you have set the levels satisfactorily in one mode, you note the results and change to other surround modes. For those modes that don't reflect your level settings, you may either copy the settings you obtained (as a short cut), or re-do the procedure to determine the correct settings for those surround modes.

System Settings

The AVR 147 offers several system settings that allow you to make the receiver easier to use rather than directly affecting performance. Most of these settings may be accessed from the SYSTEM SETUP menu, which is selected by pressing the OSD Button and navigating to the SYSTEM SETUP line of the MASTER MENU. Press the Set Button to display the submenu. See Figure 86.

Figure 86 – System Setup Menu Screen

VFD FADE TIME OUT: Some people find the brightness of the AVR's front-panel display distracting during movies or listening sessions. It's possible to dim the front-panel display completely using the Dim function (see below). This sets the display to remain dark most of the time, lighting up only when a button is pressed or a remote command is received, and going dark again 5 seconds after the last command. The VFD FADE TIME OUT feature also causes the display to light up only when a button is pressed or a change in the incoming signal is detected, but the display immediately begins to fade to dark. This setting allows you to program the length of the fade time.

Select a time-out period of between 3 and 10 seconds, or select OFF if you prefer to leave the displays on at all times or to use the Dim function.

VOLUME DEFAULT and **DEFAULT VOL SET:** These two settings are used together to program a volume level the AVR will always switch to when turned on. This feature avoids discomfort for listeners in case the last user turned the volume very high.

Press the OSD Button to remove the display from the screen so that you may adjust the volume to a desired level while a source is playing. Make a note of the number that appears in the display, and return to the SYSTEM SETUP menu. At the DEFAULT VOL SET line, select the desired volume setting, and activate the feature by setting VOLUME DEFAULT to ON.

> **NOTE:** Although volume is normally displayed in 0.5dB increments, the default volume setting only allows whole numbers.

SEMI OSD TIME OUT: At this line you may program the amount of time (2 to 5 seconds) the two-line semi-OSD on-screen messages remain, or you may deactivate the semi-OSD display altogether if you find it distracting. These messages will continue to appear on the front panel of the receiver.

FULL OSD TIME OUT: At this line you may program the amount of time (20, 30, 40 or 50 seconds) the full-OSD menus remain visible on screen. The full-OSD system may not be deactivated.

DEFAULT SURR MODE: This setting determines how the AVR 147 will handle Dolby Digital and DTS sources. For the purposes of this setting, the "default surround mode" means the mode encoded in the program, such as Dolby Digital 5.1. With this setting ON, the receiver will always use the default surround mode encoded in the program. When this setting is changed to OFF, the receiver will use the surround mode you selected the last time this type of audio stream was detected.

Dolby Digital 2.0 signals default to the Dolby Pro Logic II Movie mode, but you may select another Dolby surround mode manually. For PCM and analog sources, the factory default surround mode is Logic 7 Music. In general, the receiver will use the surround mode selected the last time that type of signal was received.

OSD BACKGROUND: This setting allows you to choose between a blue or black background for the full-OSD menus.

> **NOTE:** It isn't possible to view video sources while the full-OSD menus are displayed.

Dim Function

Some people find the front-panel messages to be distracting and would prefer to dim them or turn them off altogether. When the display is dimmed or darkened, it will return to full brightness for five seconds any time a command is received before dimming or darkening again.

To dim the display:

1. Press the Dim Button on the remote. Each button press will cycle through the three settings of:

   VFD FULL: Normal brightness

   VFD HALF: Display is dimmed but still visible; the light inside the volume knob goes dark

   VFD OFF: Display goes completely dark except for Power Indicator to remind you that the receiver is turned on

2. Press the Set Button on the front panel and hold it for about 5 seconds. A message indicating the current brightness setting (see above) will appear in the display. Use the front-panel ◀/▶ Buttons to change the setting.

Advanced Remote Control Functions

The AVR 147 remote control not only operates the AVR 147, but it also serves as a universal remote that may be programmed to operate many of your other home theater components, as described in the Installation section. Each time you select one of your other components, the AVR remote switches to the control functions for that component. Since many buttons have unique functions for each component, refer to the Function List in the Appendix for assistance in operating your other components. The function of each button will not necessarily correspond to the label printed on the button.

Punch-Through Programming

The AVR 147 remote's punch-through feature allows you to select one component for the remote to operate, while simultaneously setting certain groups of controls to operate another component. For example, while using the AVR to control surround modes and other audio functions, you may operate the transport controls of your DVD player. Or while using the remote to control video functions on your TV, you may use your cable box to change channels and the AVR to control the volume.

> **NOTE:** It is not necessary to program the remote to control your DVD player's transport controls while the AVR, VID2 or VID3 devices are in use, as the remote is preprogrammed at the factory with this function.

To program punch-through control while operating any device:

1. Press and hold the Input Selector (or AVR selector) for the main device the remote will be operating until the Program LED flashes and the remote enters Program mode.

2. Select the type of punch-through programming.

   a) To program volume control punch-through, press the Volume Up Button.

   b) To program channel control punch-through, press the Volume Down Button.

   c) To program transport control punch-through, press the Play Button.

3. Press the Input Selector (or AVR selector) for the device whose volume, channel or transport controls you would like to be active while operating the device you selected in the first step. The LED will flash green to confirm the programming.

For example, if you wish to watch your TV (programmed into the Video 3 Button) while changing channels using your cable box (Video 2), first press the Video 3 Button until the Program LED flashes. Then press the Volume Down Button, followed by the Video 2 Button.

To undo punch-through programming, follow the same steps as above, but press the same Input (or AVR) Selector in Steps 1 and 3.

You may reassign the transport control punch-through programming for the AVR, VID2 and VID3 devices to other devices, such as CD. If you wish to remove transport control punch-through altogether for the AVR, VID2 or VID3 device, follow the same procedure as for programming punch-through, but in Step 3 press either of the other two of these three special selector buttons. For example, to remove punch-through transport control from the VID3 device so that pressing any of the transport controls will have no effect, press and hold VID3 until the Program Indicator LED flashes in amber, then press the Play Button, followed by either the AVR or VID2 Button.

Macros

Macros are used to program sequences of up to 19 commands that are executed with a single button press. Macros are well-suited for power on and off commands, or to send out a favorite multidigit channel number with one button press, or to have the ability to send out a code sequence to control another device while the remote is operating one device but with more flexibility than the built-in punch-through controls.

Some commands may not be programmed into macros: Mute, Dim, Channel Up/Down, or any of the surround mode commands.

NOTE: Use caution when programming complicated macros. It isn't possible to program a pause or delay before sending commands after Power On, and the component may not be ready to respond to commands instantaneously after powering on.

To program, or "record" a macro, follow these steps:

1. Simultaneously press and hold one of the four Macro Buttons or the Power On Button and the Mute Button to enter program mode.
2. Press the Input (or AVR) Selector for each device before you enter commands to be transmitted to that device. This step counts as one of the 19 commands allowed for each macro.

NOTE: Even if you previously switched one of the dual-source Input Selectors (DVD/CD, TAPE/THE BRIDGE, HDMI 1/HDMI 2) to the primary or secondary source prior to programming the macro, the remote always requires you to press any of these selectors once to program the macro to select the primary source and twice for the secondary source.

3. For the Power On command, *do not* press the Power On button. Press the Mute Button instead.
4. Press the Power Off Button to program the Power Off command.
5. Press the Sleep Button to end the programming process.

It isn't possible to "edit" a command within a macro. However, you may erase the macro as follows:

1. Simultaneously press and hold the Mute Button and the Macro Button containing the macro until the Program LED flashes.
2. Press the Surround Button to erase the macro.

Here are two macros that you may find useful when listening to an iPod docked in The Bridge:

The purpose of the first macro is to access the DMP SETTING menu (Figure 54) while listening to The Bridge with one button press.

1. Simultaneously press and hold the M1 (or other unused) Macro Button and the Mute Button until the Program LED flashes.
2. Press the AVR Button (the first command switches the remote to AVR mode).
3. Press the OSD Button (the second command activates the on-screen menu system).
4. Press the Set Button (the third command selects the INPUT SETUP menu; this macro assumes the current source is The Bridge).
5. Press the ▼ Button three times (the fourth, fifth and sixth commands navigate to the GO TO DMP SETTING line).
6. Press the Set Button again (the seventh command selects the DMP SETTING menu).
7. Press the Sleep Button to end the programming process. You have now programmed the first macro, which will display the DMP SETTING menu after you have selected The Bridge as your source input.

After you have made your selections in the DMP SETTING menu, such as turning on repeat playback or shuffle mode, the second macro enables you to exit the on-screen menu system and return the remote to The Bridge mode, again with just one button press.

1. Simultaneously press and hold the M2 (or other unused) Macro Button and the Mute Button until the Program LED flashes.
2. Press the OSD Button (the first command exits the on-screen menu system; this macro assumes that you have not let the OSD time out).
3. Press the Tape/The Bridge Input Selector twice (the second and third commands switch the selector to The Bridge mode and select The Bridge as the source; this step is required even if you already switched the selector's mode before programming the Macro).
4. Press the Sleep Button to end the programming process. You have now programmed the second macro, which may be used after running the first macro to exit the OSD system quickly and return the remote's operation to The Bridge.

Resetting the Remote

To reset the remote to its factory defaults, simultaneously press and hold any Input Selector and the "0" Numeric Key. When the Program LED flashes in amber enter the code "333". When the green LED goes out, the remote will have been fully reset.

ADVANCED FUNCTIONS

Processor Reset

There may be instances when you wish to fully reset the AVR 147 to its factory defaults, or the unit may behave erratically after a power surge.

To correct erratic behavior, first try turning the Master Power Switch off and unplugging the AC Power Cord for at least 3 minutes. Plug the cord back in and turn the receiver back on. If this doesn't help, try a system reset.

NOTES:

- A system reset erases all user configurations, including speaker and level settings and tuner presets. After a reset, you will need to re-enter all of these settings.
- The RS-232 Reset Button on the rear panel of the AVR 147 does not perform a system reset. DO NOT press the RS-232 Reset Button.

To reset the AVR 147, place the receiver in Standby mode (press the front-panel Standby/On Switch so that the Power Indicator turns amber). Then press and hold the front-panel Tone Mode Button for at least 5 seconds until the RESET message appears in the display.

If the receiver still does not function correctly after a processor reset, contact an authorized Harman Kardon service center for assistance. Service centers may be located by visiting our Web site at www.harmankardon.com.

Memory

If the AVR 147 is unplugged or experiences a power outage, it will retain user settings for up to four weeks.

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check to see whether outlet is switch-controlled
Display lights, but no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute Button** • Turn up volume control
No sound from any speaker; light around power switch is red	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• Check speaker wire connections for shorts at receiver and speaker ends • Contact your local Harman Kardon service center
No sound from surround or center speakers	• Incorrect surround mode • Input is monaural • Incorrect configuration • Stereo or Mono program material	• Select a mode other than Stereo • There is no surround information from mono sources • Check speaker mode configuration • The surround decoder may not create center- or rear-channel information from nonencoded programs
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • Remote sensor is obscured	• Change remote batteries • Press the AVR selector • Make certain front-panel sensor is in line of sight of the remote or connect an optional remote sensor
Intermittent buzzing in tuner	• Local interference	• Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances
Letters flash in the channel indicator display and digital audio stops	• Digital audio feed paused	• Resume play for DVD • Check that Digital Input is selected
The XM Preview Channel (001) is silent	• XM antenna is not plugged in • XM antenna is not located in such a way as to enable reception	• Make sure you are using a home audio XM antenna module designed for use with XM Ready home audio equipment, and that the module is plugged into the XM Radio Jack on the rear panel of the receiver. • The XM Antenna module needs to be placed with an unobstructed view of the southern sky, or within range of an XM terrestrial repeater. If necessary, purchase an extension cable from your XM Radio dealer.

In addition to the items shown above, additional information on troubleshooting possible problems with your AVR 147, or installation-related issues, may be found in the list of "Frequently Asked Questions" which is located in the Product Support section of our Web site at www.harmankardon.com.

AVR 147 TECHNICAL SPECIFICATIONS

Audio Section

Stereo Mode
Continuous Average Power (FTC)

50 Watts per channel, 20Hz–20kHz,
@ <0.07% THD, both channels driven into 8 ohms

Five-Channel Surround Modes
Power per Individual Channel

Front L&R channels:
40 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
40 Watts @ <0.07% THD, 20Hz–20kHz into 8 ohms

Surround (L & R Side) channels:
40 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance	
Linear (High-Level)	200mV/47k ohms
Signal-to-Noise Ratio (IHF-A)	100dB
Surround System Adjacent Channel Separation	
Pro Logic I/II	40dB
Dolby Digital (AC-3)	55dB
DTS	55dB
Frequency Response	
@ 1W (+0dB, –3dB)	10Hz – 130kHz
High Instantaneous Current Capability (HCC)	±25 Amps
Transient Intermodulation Distortion (TIM)	Unmeasurable
Slew Rate	40V/µsec

FM Tuner Section

Frequency Range	87.5–108.0MHz
Usable Sensitivity	IHF 1.3µV/13.2dBf
Signal-to-Noise Ratio	Mono/Stereo 70/68dB
Distortion	Mono/Stereo 0.2/0.3%
Stereo Separation	40dB @ 1kHz
Selectivity	±400kHz, 70dB
Image Rejection	80dB
IF Rejection	90dB

SimplayHD™ The AVR 147 is Simplay HD™-verified for compatibility via the HDMI connection with other Simplay HD-verified products.

AM Tuner Section

Frequency Range	520–1720kHz
Signal-to-Noise Ratio	45dB
Usable Sensitivity	Loop 500µV
Distortion	1kHz, 50% Mod 0.8%
Selectivity	±10kHz, 30dB

Video Section

Television Format	NTSC
Input Level/Impedance	1Vp-p/75 ohms
Output Level/Impedance	1Vp-p/75 ohms
Video Frequency Response (Composite and S-Video)	10Hz–8MHz (–3dB)
Video Frequency Response (Component Video)	10Hz–100MHz (–3dB)
HDMI™	Switching

General

Power Requirement	AC 120V/60Hz	
Power Consumption	65W idle, 540W maximum (5 channels driven)	
Dimensions	(Product)	(Shipping)
Width	17-5/16 inches (440mm)	22 inches (559mm)
Height	6-1/2 inches (165mm)	10-1/2 inches (266mm)
Depth	15 inches (382mm)	18-5/16 inches (465mm)
	(Product)	(Shipping)
Weight	21.3 lb (9.7kg)	26.2 lb (11.9kg)

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.

All features and specifications are subject to change without notice.
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Please register your AVR 147 on our Web site at www.harmankardon.com. Note: You'll need the product's serial number. At the same time, you can choose to be notified about our new products and/or special promotions.

Appendix – Default settings, worksheets, remote product codes

Table A1 – Source Input Setting Defaults

Source	DVD	HDMI 1	HDMI 2	Video 1	Video 2	Video 3	The Bridge/ DMP	CD	Tape	Tuner	6-Channel	XM
Title										INT. TUNER		
Component Video Input	Comp V 1	Comp V 1	Comp V 2	Comp V 2	Comp V 2	Comp V 2	Comp V 1	Comp V 2	Comp V 1	Comp V 1	Comp V 1	Comp V 1
Audio Input	Coax 1	Coax 2	Optical 2	Analog	Optical 1	Analog	The Bridge/ DMP	Analog	Analog	Tuner	6-Channel	XM
Auto Poll	On	Off	Off	On	On	On	---	On	On	---	---	---
Surround Mode*	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music	Logic 7 5CH Music

*The default shown is the preferred surround mode for PCM and Analog audio sources.

Table A2 – Speaker/Channel Setting Defaults

Source	DVD	HDMI 1	HDMI 2	Video 1	Video 2	Video 3	The Bridge/ DMP	CD	Tape	Tuner	6-Channel	XM
Bass Manager: Global	Small	Small	Small	Small	Small	Small	Small	Small	Small	Small	Large	Small
Left/Right Speaker Size	Small	Small	Small	Small	Small	Small	Small	Small	Small	Small	Large	Small
Center Speaker Size	Small	Small	Small	Small	Small	Small	Small	Small	Small	Small	Large	Small
Surround Speaker Size	Small	Small	Small	Small	Small	Small	Small	Small	Small	Small	Large	Small
Subwoofer	Sub	Sub	Sub	Sub	Sub	Sub	Sub	Sub	Sub	Sub	Sub	Sub
Left/Right Speaker Crossover	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	N/A	100Hz
Center Speaker Crossover	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	N/A	100Hz
Surround Speaker Crossover	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	100Hz	N/A	100Hz
Subwoofer Crossover	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	Left/Right	N/A	Left/Right

Table A3 – Delay Setting Defaults

Speaker Position	Distance From Speaker to Listening Position	Your Delay Settings
Front Left	10 Feet	
Center	10 Feet	
Front Right	10 Feet	
Surround Right	10 Feet	
Surround Left	10 Feet	
Subwoofer	10 Feet	
A/V Sync Delay	0mS	

APPENDIX

Table A4 – Source Input Setting

Source	DVD	HDMI 1	HDMI 2	Video 1	Video 2	Video 3	The Bridge/ DMP	CD	Tape	Tuner	6-Channel	XM
Title										INT. TUNER		
Video Input							---			---	---	---
Component Video Input												
Audio Input							The Bridge/ DMP			Tuner	6-Channel	XM
Auto Poll							---			---	---	---
Surround Mode												

Table A5 – Speaker/Channel Setting

Source	DVD	HDMI 1	HDMI 2	Video 1	Video 2	Video 3	The Bridge/ DMP	CD	Tape	Tuner	6-Channel	XM
Bass Manager: Global											N/A	
Left/Right Speaker Size											N/A	
Center Speaker Size											N/A	
Surround Speaker Size											N/A	
Subwoofer											N/A	
Left/Right Speaker Crossover											N/A	
Center Speaker Crossover												
Surround Speaker Crossover												
Subwoofer Crossover												
Left/Right Channel Level††												
Center Channel Level††												
Surround Channel Level††												
Subwoofer Channel Level††												

† The 6-channel inputs are "direct" inputs, meaning their signals are passed directly to the volume control without any bass management processing. Thus, the speaker sizes are always full range, and it isn't possible to adjust speaker size crossover.

†† Channel levels vary by surround mode rather than source input.

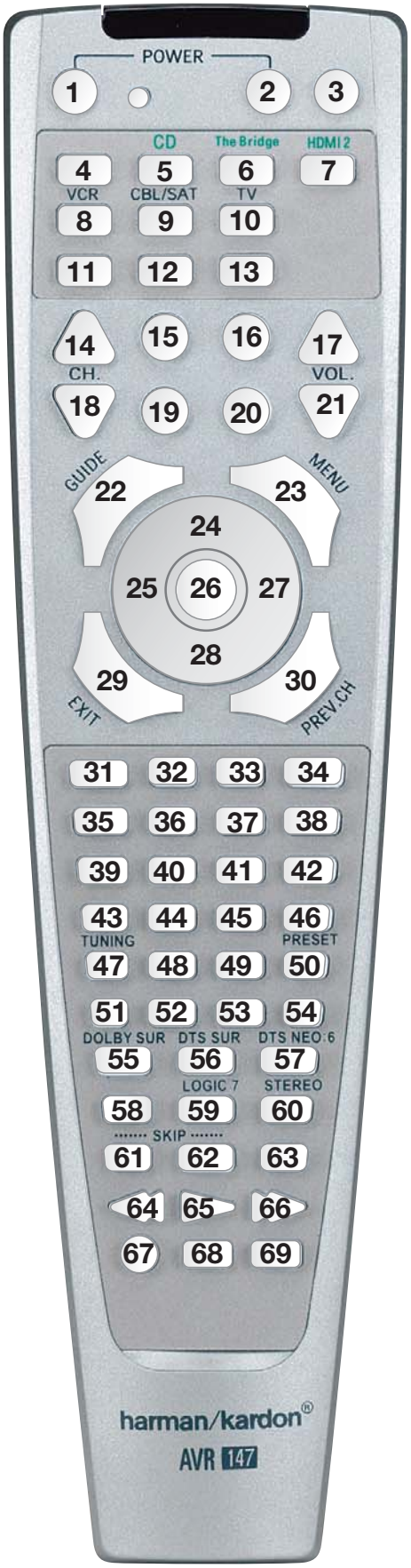
Table A6 – Remote Control Codes

Source Input	Product Type (circle one)	Remote Control Code
Video 1	VCR, PVR	
Video 2	Cable, Satellite	
Video 3	TV	
DVD	DVD	
CD	CD, CDR	
Tape	Cassette	
HDMI 1	VCR, PVR, DVD, Cable, Satellite	
Tape	VCR, PVR, DVD, Cable, Satellite	

Table A7 – System Settings

Feature	Default Setting	Your Setting
VFD Fade Time-Out	Off	
Volume Default	Off	
Default Vol Set	–25dB	
Semi-OSD Time-Out	5 Seconds	
Full-OSD Time-Out	20 Seconds	
Default Surr Mode	On	
OSD Background	Blue	

APPENDIX



Refer to the numbered buttons in this drawing when using the Function List.

Figure 87 – Remote Control Function List Reference

Table A8 – Remote Control Function List

No.	Button Name	AVR Function	DVD	CD/CD-R	Tape	VCR (VID1)	TiVo (VID1)	CBL (VID2)	SAT (VID2)	TV (VID3)	The Bridge (DMP)	XM	HDMI 1/2
1	Power On	Power On	Power On	Power On		Power On	Power On/Off	Power On	Power On	Power On		Power On	Power On
2	Power Off	Power Off	Power Off	Power Off		Power Off	TV Power	Power Off	Power Off	Power Off		Power Off	Power Off
3	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute	Mute		Mute	Mute
4	AVR	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select	AVR Select
5	DVD/CD	DVD Input Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Select	DVD Input Select
		CD Input Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD Select	CD InputSelect
6	Tape/ The Bridge	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select	Tape Select
		The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select	The Bridge (DMP) Select
7	HDMI1/HDMI 2	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select	HDMI 1 Select
		HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select	HDMI 2 Select
8	VID 1 (VCR)	Video 1 Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select	VCR Select
9	VID 2 (CBL/SAT)	Video 2 Select	CBL/SAT Select	CBL/SAT Select	CBL/SAT Select	CBL/SAT Select	CBL/SAT Select	CBL Select	SAT Select	CBL/SAT Select	CBL/SAT Select	CBL/SAT Select	CBL/SAT Select
10	VID 3 (TV)	Video 3 Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select	TV Select
11	XM	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select	XM Select
12	AM/FM	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select	Tuner Select
13	6CH	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select	6 Ch. Input Select
14	Sleep/CH+	Sleep				Channel +	Channel +	Channel +	Channel +	Channel +			Channel +
15	Test Tone	Test Tone											
16	T/V		TV/DVD or V. OFF	Input Select		TV/VCR	TV Input	TV/CBL	TV/SAT	TV/VCR			TV/Video
17	Vol Up	Volume Up	Volume Up	Volume Up		Volume Up	Volume Up		Volume Up	Volume Up	Volume Up		
18	Surr/CH–	DSP Surround Mode Select	Disc Menu or Title	CDR Select		Channel –	Channel –	Channel –	Channel –	Channel –			Channel –
19	OSD	OSD		Program		OSD	Live TV	OSD	OSD	OSD			OSD
20			HD Mode										
21	Vol Down	Volume Down	Volume Down	Volume Down		Volume Down	Volume Down		Volume Down	Volume Down	Volume Down		
22	CH./Guide	Channel Trim	Title or Disc Menu	Continuous Play			Guide	Info/Guide	Info/Guide				Guide
23	Speaker/Menu	Speaker Setup	Menu or Setup	Intro Scan		Menu	Menu	Menu	Menu	Menu	Menu		Menu
24	▲	Move/Adjust Up	Up			Up	Up	Up	Up	Up		Up	Up
25	◄	Move/Adjust Left	Left			Left	Left	Left	Left	Left	Scroll –	Left	Left
26	Set	Set	Enter			Enter	Select	Enter	Enter	Enter	Select	Set	Set/Enter
27	►	Move/Adjust Right	Right			Right	Right	Right	Right	Right	Scroll +	Right	Right
28	▼	Move/Adjust Down	Down			Down	Down	Down	Down	Down		Down	Down
29	Digital/Exit	Digital Input Select	Open/Close				Return/Exit						
30	Delay/Prev. Ch.	Delay Adjust	Return or Status	Open/Close				Prev Channel	Prev Channel	Prev Channel			Prev. Channel
31	1	1	1	1		1	1	1	1	1		1	1
32	2	2	2	2		2	2	2	2	2		2	2
33	3	3	3	3		3	3	3	3	3		3	3
34	4	4	4	4		4	4	4	4	4		4	4
35	5	5	5	5		5	5	5	5	5		5	5
36	6	6	6	6		6	6	6	6	6		6	6
37	7	7	7	7		7	7	7	7	7		7	7
38	8	8	8	8		8	8	8	8	8		8	8
39	Tun-M	Tuning Mode	Chapter+ or Zoom	Repeat								Tuning Mode	
40	9	9	9	9		9	9	9	9	9		9	9
41	0	0	0	0		0	0	0	0	0		0	0

Table A8 – Remote Control Function List (continued)

No.	Button Name	AVR Function	DVD	CD/CD-R	Tape	VCR (VID1)	TiVo (VID1)	CBL (VID2)	SAT (VID2)	TV (VID3)	The Bridge (DMP)	XM	HDMI 1/2
42	Memory	Memory	Audio or Playlist	Time								Memory	
43	Tuning Up	Tuning Up	Next Chapter	Track Direct		Cancel			Cancel	Sleep		Tuning Up	
44	Direct	Direct Tuner Entry	Angle	Random Play				FAV/Angle	FAV				Angle/FAV
45	Clear	Clear	Clear	Clear		Clear	Clear		Next			Clear	
46	Preset Up	Preset Tune Up	Slow Forward	+10					Alt			Preset Up	
47	Tuning Down	Tuning Down	Prev Chapter	Track Increment								Tuning Down	
48	Tone	Tone mode		Program									
49	D. Skip	Disc Skip (DVD)	Disc Skip	Disc Skip			Skip						
50	Preset Down	Preset Down	Slow Rev									Preset Down	
51	M1	Macro 1	Macro 1	Macro 1	Macro 1	Macro 1	Macro 1	Macro 1	Macro 1	Macro 1		Macro 1	Macro 1
52	M2	Macro 2	Macro 2	Macro 2	Macro 2	Macro 2	Macro 2	Macro 2	Macro 2	Macro 2		Macro 2	Macro 2
53	M3	Macro 3	Macro 3	Macro 3	Macro 3	Macro 3	Macro 3	Macro 3	Macro 3	Macro 3		Macro 3	Macro 3
54	M4	Macro 4	Macro 4	Macro 4	Macro 4	Macro 4	Macro 4	Macro 4	Macro 4	Macro 4		Macro 4	Macro 4
55	Dolby Surround	Dolby Modes											
56	DTS Surround	DTS Digital Modes											
57	DTS Neo:6	DTS Neo:6 Select											
58	Night	Night Mode Select	Subtitle On/Off	CDP Select									
59	Logic 7	Logic 7 Select											
60	Stereo	Stereo Mode Select											
61	Skip Down	Skip – (DVD)	Step –	Skip –		Scan –	Thumbs Down	Skip – (DVD)	Skip – (DVD)	Skip – (DVD)			
62	Skip Up	Skip + (DVD)	Step +	Skip +		Scan +	Thumbs Up	Skip + (DVD)	Skip + (DVD)	Skip + (DVD)			
63	Dim	Dimmer											
64	Rewind (◀◀)	R. Search (DVD)	R. Search	R. Search	Rewind	Rewind	R. Search	R. Search (DVD)	R. Search (DVD)	R. Search (DVD)	Skip–/R. Search		R. Search
65	Play (◀▶)	Play (DVD)	Play	Play	R. Play/F. Play	Play	Play	Play (DVD)	Play (DVD)	Play (DVD)	Play		Play
66	F F (▶▶)	F. Search (DVD)	F. Search	F. Search	Fast Fwd	Fast Fwd	F. Search	F. Search (DVD)	F. Search (DVD)	F. Search (DVD)	Skip+/F. Search		F. Search
67	Record			Record	Record/Pause	Record	Record						Record
68	Stop	Stop (DVD)	Stop	Stop	Stop	Stop	Slow	Stop (DVD)	Stop (DVD)	Stop (DVD)			Stop
69	Pause	Pause (DVD)	Pause	Pause		Pause	Pause	Pause (DVD)	Pause (DVD)	Pause (DVD)	Pause		Pause

NOTE: When any of the transport controls are pressed while the remote is in AVR, Video 2 or Video 3 mode, the remote will automatically switch to DVD mode and the command will be applied to the DVD player. If you then press a button native to the original mode, e.g., Volume Down for the AVR, the remote will revert to the original mode. See Punch-Through Programming, described in the Advanced Functions section, for more information.

Refer to Tables A9 through A16 when programming the codes for your components into the remote.

Table A9 – Remote Control Product Codes – **TV**

TV Manufacturer/Brand	Setup Code Number
AIWA	027
A MARK	122 132
ADMIRAL	192
AKAI	123 160
AMPRO	164
ANAM	045 106 109 112 122
AOC	122 123 128
BLAUPUNKT	084
BROKSONIC	205 206
CANDLE	123 128
CAPEHART	059
CENTURION	123 171
CENTRONIC	045
CITIZEN	045 123 128 132
CLASSIC	045
CONCERTO	128
CONTEC	045
CORANDO	172
CORONADO	132
CRAIG	045 157 158 159
CROWN	045 132
CURTIS MATHES	123 128 132
CXC	045
DAEWOO	045 087 102 105 106 108 111 114 116 119 127 128 132
DAYTRON	128 132
DIGI LINK	200
DYNASTY	045
DYNATECH	063
ELECTROHOME	115 132
EMERSON	045 123 128 132 139 157 158 159 162 205
FUNAI	045
FUTURETECH	045
GE	029 087 121 123 128 133 147 159 163
GOLDSTAR/LG	101 110 122 128 132
GRUNDIG	193
HALL MARK	128
HARMAN KARDON	201
HITACHI	123 128 132 144 147
INFINITY	148
INKEL	120
JBL	148
JC PENNEY	115 123 128 132 147
JENSEN	019
JVC	079 087 134
KAWASHO	173
KEC	045
KENWOOD	123 204
KMC	132
KTV	045 123 132 162

TV Manufacturer/Brand	Setup Code Number
LLOYTRON	172 173
LODGENET	069
LOGIK	069
LUXMAN	128
LXI	077 147 148
MAGNAVOX	030 123 128 132 147 148
MARANTZ	115 123 148
MATSUI	148
MEMOREX	069 128
METZ	084
MGA	115 123 128
MINERVA	084
MITSUBISHI	077 115 123 128 160 167 168
MTC	175 176
NATIONAL	148 177 179 180 181 182
NEC	115 121 123 125
NIKEI	045
ONKING	045
ONWA	045
OPTONICA	077
ORION	207 208 209 210 211
PANASONIC	087 148 169
PHILCO	045 115 123 128 132 148
PHILIPS	033 034 035 036 123 128 132 147 148
PIONEER	024 123 128
PORTLAND	128 132
PROSCAN	133
PROTON	059 122 128 132 165
QUASAR	032 087
RADIO SHACK	045 128 132 180 196 197
RCA	021 115 123 128 133 147 161 163
REALISTIC	045 167 196
RUNCO	152 153
SAA	183
SAMPO	059 123 128
SAMSUNG	020 022 124 128 132 147
SANYO	026 054
SCOTT	045 128 132
SEARS	128 132 147
SHARP	077 128 132
SIEMENS	084
SIGNATURE	069
SONY	028 031 117 130 136 194 212
SOUNDESIGN	045 128
SPECTRICON	122
SSS	045
SYLVANIA	025 123 128 147 148
SYMPHONIC	184
TANDY	077
TATUNG	063
TECHNICS	181

Table A9 – continued

TV Manufacturer/Brand	Setup Code Number
TECHWOOD	128
TEKNIKA	045 069 115 123 128 132
TELERENT	069
TERA	156
THOMSON	190 191
TMK	128
TOSHIBA	063 129 202
TOTEVISION	132
VIDEO CONCEPTS	160
VIDTECH	128
WARDS	069 128 132 148
YAMAHA	123 128
YORK	128
YUPITERU	045
ZENITH	069 090
ZONDA	122

Table A10 – Remote Control Product Codes – **VCR**

VCR Manufacturer/Brand	Setup Code Number
AIWA	040
AKAI	048 108 109 126
AMPRO	076
ASA	134
AUDIO DYNAMICS	018 048
BROKSONIC	110 147
CANDLE	134 135
CANON	135 140
CAPEHART	094
CITIZEN	134
COMCAST	006
CRAIG	045 116
DAEWOO	017 094 104
DAYTRON	094
DBX	018 048
DYNATECH	040
EMERSON	013 040 042 110 112
FISHER	017
FUNAI	040
GE	076 095 124
GO VIDEO	113
GOLDSTAR/LG	018 107
HARMAN KARDON	018 049
HITACHI	040 048
JC PENNEY	018 045
JENSEN	048
JVC	018 048 111 132
KENWOOD	020 048
LLOYD	040
LXI	020 040
MAGIN	045
MAGNAVOX	040

Table A10 – continued

VCR Manufacturer/Brand	Setup Code Number
MARANTZ	018
MEMOREX	017 020 040 052 053 054 076
MGA	049
MITSUBISHI	049 131
MULTITECH	040
NAD	139
NATIONAL	140
NEC	018 048
NORDMENDE	048
OPTIMUS	159
ORION	147
PANASONIC	125 150 167 172
PHILCO	040
PHILIPS	040 075
PORTLAND	094
PULSAR	076
QUASAR	001 125
RADIO SHACK	055 134 140 142 158 159
RCA	095 124 125 157 172
REALISTIC	017 020 040 045 159
SALORA	020
SAMSUNG	045 051 095 105 109
SANSUI	048 116 147
SANYO	017 020
SCOTT	110 112
SEARS	017 020
SHARP	129 156
SONY	080 129
SOUNDESIGN	040
SYLVANIA	040
SYMPHONIC	040
TANDY	017 040
TASHICO	134
TATUNG	048
TEAC	040 048
TEKNIKA	040
THOMAS	040
TiVo	002 003 004 005 007 008 012
TMK	013
TOSHIBA	112 155
TOTEVISION	045
UNITECH	045
VECTOR RESEARCH	018
VIDEO CONCEPTS	018 040
VIDEOSONIC	045
WARDS	040 045 112
YAMAHA	018 040 048
ZENITH	040 050 076 083

Table A11 – Remote Control Product Codes – **CD**

CD Manufacturer/Brand	Setup Code Number
ADCOM	063 069
AIWA	072 111 118 156 170
AKAI	050 177 184
AUDIO TECHNICA	053
AUDIOACCESS	125
AUDIOFILE	211
BSR	044
CALIFORNIA AUDIO	109
CAPETRONIC	070
CARRERA	087
CARVER	136 140 141 143 144 147 185 186
CASIO	117 166
CLARINETTE	166
DENON	187 188 213
EMERSON	052 093 108
FISHER	055 095
FRABA	117
FUNAI	126
GE	164
GENEXXA	108
GOLDSTAR/LG	016 087
HAITAI	099 214
HARMAN KARDON	001 002 025 054 190
HITACHI	093
INKEL	216
JC PENNEY	098 147
JENSEN	153
JVC	176 195 196
KENWOOD	030 062 078 079 148 151 176 178 181
LOTTE	108
LUXMAN	077 102
LXI	164
MAGNAVOX	039 113
MARANTZ	058 084 191 192 193
MCINTOSH	194
MCS	080 098
MITSUMI	152
MODULAIRE	166
NAD	013 074 197 198
NAKAMICHI	199 200 201
NEC	069
NIKKO	053 055
ONKYO	037 038 045 046 171 175 202 203
OPTIMUS	065 089 091 092 099 104 212
PANASONIC	075 109 119 158 183 204
PHILIPS	039 138 149 209
PIONEER	071 094 100 112 123 131 161 162 215
PROTON	210
QUASAR	109
RADIO SHACK	126 166 213
RCA	024 081 093 150
RCX	169
REALISTIC	058 093 095 104 105 108 164 166
SANSUI	047 081 134 157 172
SANYO	033 082 095
SCOTT	108
SHARP	058 105 114 151 159 167 180 181
SHERWOOD	003 041 058 105 133
SONY	103 115 116 118 132 139 163 205 206 207 208 212 217
SOUNDSTREAM	124
SYMPHONIC	059 110
TAEKWANG	177
TEAC	011 058 085 086 106 107 110 121 137 146 154
THETA DIGITAL	039
TOSHIBA	013 074 097 151 155 173
VECTOR RESEARCH	087
VICTOR	120 130
WARDS	095
YAMAHA	019 031 053 061 135 169
YORK	166

Table A12 – Remote Control Product Codes – **DVD**

DVD Manufacturer/Brand	Setup Code Number
APEX DIGITAL	061
DENON	019 051
GE	003 004
GOLDSTAR/LG	005 055 064 066
HARMAN KARDON	001 002
JVC	006
MAGNAVOX	056
MARANTZ	059
MITSUBISHI	023
NAD	062
ONKYO	009 048
PANASONIC	024 030 044
PHILIPS	056
PIONEER	041 065
PROCEED	060
PROSCAN	003 004
RCA	003 004
SAMSUNG	053 054
SHARP	028
SONY	043 045
THOMSON	003 004
TOSHIBA	009 058 067
YAMAHA	030 063
ZENITH	005 055 064

APPENDIX

Table A13 – Remote Control Product Codes – **SAT**

SAT Manufacturer/Brand	Setup Code Number
ALPHASTAR	472
ALPHASTAR DBS	450
ALPHASTAR DSR	442
BIRDVIEW	425
CHANNEL MASTER	320 321 325 361
CHAPARRAL	315 316 451
CITOH	360
DRAKE	313 317 318 413 481
DX ANTENNA	331 352 379 483
ECHOSTAR	395 397 452 453 463 477 478 484 485
ELECTRO HOME	392
FUJITSU	324 329 334
GENERAL INSTRUMENT	303 311 323 365 403 454 468 474
HITACHI DBS	455
HOUSTON TRACKER	463
HUGHES	437 489
JANIEL	366
JERROLD	454 468 484
KATHREIN	410
LEGEND	453
MACOM	317 365 369 370 371
MAGNAVOX	461 473
MEMOREX	453
NEXTWAVE	423
NORSAT	373
OPTIMUS	466
PACE DSS	487
PANASONIC	366 469
PANASONIC DBS	457
PANSAT	420
PERSONAL CABLE	418
PHILIPS	375
PICO	407
PRESIDENT	381 404
PRIMESTAR	412 454 468 475
RCA	301 439 465 490
RCA DSS	458
REALISTIC	349 480
SAMSUNG	442
SATELLITE SERVICE CO	335 388
SCIENTIFIC ATLANTA	339
SONY	405
STAR CHOICE DBS	459
STARCAST	347
SUPER GUIDE	327 423
TEECOM	330 333 390 391 393 409
TOSHIBA	302 426 460 461 462 470
UNIDEN	323 332 348 349 350 351 354 355 381 383 389 403 466 479 480
ZENITH	384 385 387 394 419 488

Table A14 – Remote Control Product Codes – **TAPE**

TAPE Manufacturer/Brand	Setup Code Number
HARMAN KARDON	001

Table A15 – Remote Control Product Codes – **CBL**

CBL Manufacturer/Brand	Setup Code Number
ABC	001 011
ALLEGRO	111
AMERICAST	212
ARCHER	112
BELCOR	113
CABLE STAR	033 113
CITIZEN	111
COLOUR VOICE	085 090
DIGI	114
EAGLE	186
EASTERN	066 070
ELECTRICORD	039
EMERSON	112
FOCUS	116
G.I.	001 011 017 096 097
GC ELECTRONICS	113
GEMINI	032 060
GENERAL	210
GENERAL INSTRUMENT	210
GOODMIND	112
HAMLIN	056 099 100 101 117 175 208
HITACHI	001 188
JASCO	111
JERROLD	001 002 011 017 073 096 097 162 188 210
LINDSAY	118
MACOM	191
MAGNAVOX	017 019 068
MOVIE TIME	035 039
NSC	035 190
OAK	197 220
PACE	179
PANASONIC	053 176 177 189 214
PANTHER	114
PHILIPS	013 019 020 085 090
PIONEER	001 041 119 171 209 215 216
POPULAR MECHANICS	116
PRELUDE	120
PRIMESTAR	162
RADIO SHACK	111 112 213
RCA	053 214
RECOTON	116
REGAL	056 099 100 101 208
REMBRANT	032
SAMSUNG	003 072 186
SCIENTIFIC ATLANTA	183 203 221 222
SEAM	121

Table A15 – continued

CBL Manufacturer/Brand	Setup Code Number
SIGNATURE	001 188
SPRUCER	053 081 177 189
STARCOM	002 011 163
STARGATE	120
TANDY	024
TELECAPATION	028
TEXSCAN	036
TFC	122
TIMELESS	123
TOCOM	170 205
UNITED CABLE	011
UNIVERSAL	033 034 039 042 113
VIDEOWAY	124 211
VIEWSTAR	019 025 086 089 190
ZENITH	065 125 211 219
ZENTEK	116

Table A16 – Remote Control Product Codes – **THE BRIDGE/DMP**

Manufacturer/Brand	Setup Code Number
HARMAN KARDON	001
TEN TECHNOLOGIES	002

NOTES

NOTES

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